632

# MEMOIRS OF THE ARCHÆOLOGICAL SURVEY OF INDIA

## No. 35

## Excavations in Baluchistan 1925, Sampur Mound, Mastung and Sohr Damb, Nāl.

BY

H. HARGREAVES.

*Superintendent, Archæological Survey, Frontier Circle.*

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WITH AN APPENDIX BY

LT.-COL. R. B. SEYMOUR SEWELL, I.M.S., AND DR. B. S. GUHA.

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# CONTENTS


| | PAGE. |
|---|---|
| List of Plates | *i* |
| Preface | *iii* |
| Excavations at Mastung | 1 |
| Appendix A | 8 |
| Appendix B | 12 |
| Appendix C | 13 |
| Excavations at Nāl | 17 |
| Appendix I | 40 |
| Appendix II | 43 |
| Appendix III | 44 |
| Appendix IV | 45 |
| Appendix V. Report on the bones excavated at Nāl by R. B. Seymour Sewell, M.A., F.A.S.B., F.L.S., F.Z.S., Lt.-Col., I.M.S., and B. S. Guha, A.M., Ph.D. | 56 |
| Catalogue of Bones contained in the collection | 81 |
| Bibliography | 87 |
| Index | 90 |

# LIST OF PLATES.


PLATE I.—Plan of Sampur Mound, Mastung.
PLATE II.—(*a*) Sampur Mound from south.
(*b*) Trench G. Vessels *in situ*.
(*c*) Excavated vessels sent to the Quetta Museum.
(*d*) The Miri, Kalat.
PLATE III.—(*a*) Trench A. Vessels *in situ*.
(*b*) Trench B. Vessels *in situ*.
(*c*) Shallow dish with incised ornament.
PLATE IV.—(*a*) Silver cup as found.
(*b*) Silver cup after cleaning.
(*c*) Trench H.
(*d*) Bronze casket and centaur.
(*e*) Miniature vessels.
PLATE V.—(*a*) Miniature vessels.
(*b*) Jug and drinking vessels.
(*c*) Hand made vessels.
(*d*) Hand made utensils.
PLATE VI.—Plan of the Sohr Damb.
PLATE VII.—Plan and section of Area A.
PLATE VIII.—Plan and section of Area D.
PLATE IX.—(*a*) Sohr Damb from south.
(*b*) Sohr Damb from west.
(*c*) Area A after excavation.
PLATE X.—(*a*) Area A from south-west.
(*b*) Area A from south-east.
PLATE XI—(*a*) Burial groups C 3 and C 4.
(*b*) Burial group F.
PLATE XII.—(*a*) Complete burial.
(*b*) Burial group B.
(*c*) Burial group A.
(*d*) Burial group in G 3.
PLATE XIII.—(*a*) Area D looking south.
(*b*) Interior of room D 6 from south.
PLATE XIV.—(*a*) Copper implements.
(*b*) Copper implements.
PLATE XV.—(*a*) Beads.
(*b*) Stone antiquities.
(*c*) Two vessels concealing fragment of skull.
(*d*) Copper seal.
(*e*) Infant's grave in A 7.
(*f*) Seal and sealing.

PLATE XVI.—Pottery forms from Nāl.
PLATE XVII.—Designs on Nāl pottery.
PLATE XVIII.—Nāl Pottery. Types 1-11.
PLATE XIX.—Nāl Pottery. Types 12-30.
PLATE XX.—Four polychrome vessels.
PLATE XXI.—Potsherds, figurines and funerary implements.
PLATE XXII.—FIG. 1. The skull, viewed from right side (Norma lateralis).
FIG. 2. The skull, viewed from behind (Norma occipitalis).
FIG. 3. The skull, viewed from in front (Norma facialis).
FIG. 4. The skull, viewed from above (Norma verticalis).
FIG. 5. The skull, viewed from below; showing the stone *in situ* at the back of the Palate and Posterior Nares.
PLATE XXIII.—FIG. 1. The os innominatum (Item 6, collection No. 10, Group E).
FIG. 2. The head and upper end of the femur (Item 22, Collection No. 14, Group B, from Room 6).
FIG. 3. (*a*) Adult femur, from in front.
(*b*) Adult femur, from behind.
(*c*) Infant femur (the epiphyses are wanting) from behind.
FIG. 4. Calcaneum. (*a*) from above. (*b*) from below.
PLATE XXIV.—FIG. 1. The stone, viewed from (*a*) above, (*b*) the side (Natural size).
FIG. 2. Outlines of the "Nāl" skull (black) and the "Sialkot" skull (dotted).
FIG. 3. Optical transverse sections of various long bones.
(*a*) Adult femur, upper part of shaft, Right side.
(*b*) Adult femur, at middle of pilaster, Right side.
(*c*) Adult tibia, about middle of shaft, Left side.
(*d*) Infant femur, upper part of shaft, Left side.
(*e*) Infant femur, at middle of pilaster, Left side.
(*f*) Infant tibia, about middle of shaft, Right side.

# PREFACE.

The discovery in 1923-24 of evidences of an early, highly developed, widespread and hitherto unknown civilization in the Indus basin as exemplified by the discoveries at Harappa in the Montgomery District of the Punjab and at Mohenjodaro in the Larkana district of Sind [1] excited the liveliest interest and gave rise to many conjectures as to its date and origin. After Professor Sayce had pointed out the close resemblance between many of the objects from these sites and certain Proto-Elamite antiquities from Susa[2] and when later Messrs. Gadd and Sidney Smith[3] gave a detailed comparison of the pictographic scripts found in both the Indus valley and Babylonia showing the existence of likenesses which could hardly be accidental, attention was naturally directed to Baluchistan, the country lying between these two important river basins and where connecting links between the two cultures might reasonably be expected to be recovered.

In each of the twelve District Gazetteers of Baluchistan mention is made of artificial mounds locally called *dambs*, which everywhere dot the country and references to mounds occur also in the accounts of early travellers [4] but with little detailed information on which to base any conclusions as to their respective dates or comparative importance.

The only reliable information concerning any of these mounds is that contained in Dr. Fritz Nœtling's[5] report on certain prehistoric mounds in the Zhob valley visited by him some thirty years ago, and in Sir Aurel Stein's[6] report of a survey made in 1904. Of actual excavations carried out in Baluchistan records are scanty, and none, save Mockler's[7] account of his operations in Makran over fifty years ago, are at all detailed or informative. Baluchistan, therefore, appeared to offer a seemingly limitless and almost virgin field to the practical archæologist, the only difficulty being to decide between

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[1] *A. S. I.* 1923-24, p. 47 ; *Illustrated London News, September 20th, 1924.*

[2] A. H. Sayce. *Illustrated London News, September 27th, 1924.*

[3] C. J. Gadd and Sidney Smith. *Illustrated London News, October 4th, 1924.*

[4] Masson. *Journeys in Baluchistan, Afghanistan and the Punjab, Vol. II, p. 43.*

[5] Nœtling. *Zeitschrift für Ethnologie 1898, p. 460.*

[6] Stein. *Report of Archæological Survey work in N.-W. F. P. and Baluchistan, 1904-5.*

[7] Mockler. *On Ruins in Makran. J. R. A. S., 1877, N. S. 9, p. 121. Proceedings A. S. B., August 1876, p. 172, July 1877, p. 157.*

the conflicting claims of so many sites, for it was plain from such records as did exist that all these *dambs* were not of the same age or equal importance and some, indeed, seemed referable to the Buddhist period.

It was resolved finally to limit excavations to two sites only and to explore first the Sampur Mound at Mastung, some thirty-three miles south of Quetta as this was reported to be "the most noteworthy mound" in Sarawan,[1] and to be strewn with pieces of ancient pottery and to yield beads and occasionally large earthen jars, and then to proceed some two hundred miles southward to examine the Sohr Damb at Nāl in Jhalawan, the site which had yielded the beautiful pottery described by Sir John Marshall in the Annual Report of the Archæological Survey of India for the year 1904-5. The operations at these two sites form the subject of this Memoir.

Archæological exploration in remote parts of so sparsely populated a land as Baluchistan is possible only with the help and co-operation of the local officials and the success of our expedition was due in no small measure to the assistance received from The Hon'ble Sir Frederick Johnston, K.C.I.E., C.S.I., I.C.S., Agent to the Governor General and Chief Commissioner in Baluchistan and his officers. In particular we are indebted to Lieut.-Col. T. H. Keyes, C.M.G., C.I.E., Political Agent, Kalat, Nawab Sir Mir Shams Shah, K.C.I.E., I.S.O., Wazir-i-Azam, Kalat State, and Mr. H. J. Todd, Assistant Political Agent, Kalat, who not only evinced a lively interest in our work but spared no effort to further it by arranging for transport, accommodation and supplies.

Nāl lies in the jurisdiction of the Bizanjau Chief, Sardar Faqir Muhammad, who procured for us local labour and assumed responsibility for our protection while in his territory. In acknowledging his assistance it would be ungrateful not to recall also the friendliness displayed by the tribesmen and the cheerfulness and honesty of the Brahui workmen.

Our most grateful acknowledgments are also due to Colonel Deas, I.M.S., Chief Medical Officer, Baluchistan, for medical assistance and vaccine sent out to us during an outbreak of small-pox at Nāl.

During our stay in Quetta Mr. Clinton Bond, Curator, McMahon Museum, was untiring in his endeavours on our behalf. He placed at our disposal the resources of the museum, supplied valuable information concerning ancient sites in the vicinity of Quetta and in countless other ways rendered us his most grateful debtors.

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[1] *Sarawan Gazetteer, p. 42.*

# EXCAVATIONS IN BALUCHISTAN.

## EXCAVATION AT MASTUNG.

MASTUNG lies some thirty-three miles south of Quetta in 27° 48′ N. Lat. and 66° 47′ E. Long. and is the second largest town in the Sarawan Division of the Kalat State. Being 5,590 feet above sea level it possesses a salubrious climate and is noted for the excellence of the fruits and wheat grown in its vicinity. As such a spot was likely to have been inhabited from very early days it was felt that mounds in its neighbourhood might yield evidence of very early civilizations. According to the Gazetteer[1] the most noteworthy mound in Sarawan is " the Sampur which lies about four miles west of Mastung and is believed to be the remains of a city founded by Sam, the grandfather of the Persian hero Rustam." As large vessels from this mound were already in the McMahon Museum, Quetta, and as beads and other antiquities were reported to have been recovered there, it was decided that we could not do better than begin work on that site.

The main axis of the mound runs roughly east and west and measures some 600 feet,—a measurement, it must be confessed, which even allowing for shrinkage, is hardly compatible with its having been a city site (Pl. I). For convenience of description it may be divided into four separate areas (Pl. II *a*).

Area 1 is the eastern extremity and lowest portion of the mound. It measures some 180 feet from north to south and is more or less[1] level, nowhere rising more than eight feet above the adjacent fields. Potsherds were most abundant in this area and it was here that Trenches A, B and G were dug (Pl. I).

Area 2 is the highest portion of the site and rises some 45 feet above the plain. From east to west it is 260 feet and some 300 feet from north to south. The highest portion is of grey earth and the sides have a sprinkling of potsherds. On the north side is a low flat area with many pottery fragments. Trench H was carried from its northern edge due south to the top of the mound.

Area 3 is a natural hillock covered with gravel, but on a low spur running 120 feet to the northward some potsherds are found.

Area 4 is also a low natural mound covered with gravel, the disintegration of a former conglomerate cap. No potsherds are found in this area.

[1] *Sarawan Gazetteer, p. 42.*

Around the base of the mound and here and there on its flanks trenches had been dug by troops during manœuvres, and villagers had also dug deeply into the mound on the south side, in order to extend their fields and to obtain earth, but none of these excavations had revealed walls, though mud bricks could be traced in the face of one cutting, where the wind and rain had exposed their edges by removing the softer mud mortar.

Excavation was begun on the 15th March 1925, on the flatter and lower portion to the east of the mound, Pl. I, and Pl. II (*a*). Trench A was run northward across this area and a few days later Trench B at right angles to this was carried to the eastward. In both these trenches, which were dug in places to a depth of more than ten feet, large earthen vessels were found, sometimes grouped together and frequently at markedly different levels (Pl. III *a* & *b*). Later at a point in B, where a group of these vessels was discovered, a trench G was carried at right angles across Trench B and here again more of these large vessels were disclosed (Pl. II *b*), but no walls and no floorings.

Still hoping to recover some structural remains it was decided to dig another trial trench on the north side of Area 2, and across the spur behind Area 3. This (Trench E, Pl. I) proved that the spur was a natural elevation but on the east side of it more large vessels were again recovered at various depths, from one foot to six feet underground. The material on the eastern limit of this trench was exceedingly hard and seemingly the remains of beaten earth, but no face of a wall could be traced or certain evidence of mud brick. Layers of ashes to be seen at a height of six feet in the south face of the highest portion of the mound (Pl. II *a*), seemed to indicate that all above was artificial. In an endeavour to ascertain to what this great height was due Trench H was carried from the low northern edge of the mound southward to the very top of the highest portion (Pl. I; Pl. IV *c*). The lower portions again yielded large vessels, but the uppermost sections gave clear evidence of *kachcha* brick. The material in all the upper sections of Trench H was very compact earth, possibly the remains of sun-dried bricks, and here no vessels were found. It was as though this area had been a deep and extensive foundation. Aided by the excessive dryness and a fierce wind which blew daily from about noon to sundown it became possible to trace on the very top of the mound the interior walls of a small room. These walls were of *kachcha* brick faced with mud plaster. The walls were not perfectly rectangular, the ends being 9′ 4″, the two sides 14′ 0″ and 14′ 6″. No other rooms were traced elsewhere in this excavation. In the higher section of Trench H a small rectangular pit 2′ 10″×2′ 5″ was found. The faces of this shaft were quite distinct but not, apparently, of mud brick. The upper portion was filled with black ashy soil, the lower with soft earth which had clearly drifted into it. To ascertain its purpose it was cleared to a depth of 16 feet. Nothing was recovered in clearance and its purpose is doubtful. It may have been a drain or even a granary, but in the latter case it would be difficult to empty.

In order to ascertain the former extent of occupation to the east two trenches C and D were dug across a field contiguous with the mound (Pl. I). Although dug to a depth of six feet they proved sterile and were again filled in. It would, therefore, appear as if the present eastern edge of the mound marks pretty correctly the extent of the former occupation. A small trench F was dug on the south side of the mound at a spot whence the villagers had removed earth, but nothing save a few potsherds was recovered here (Pl. I).

No stone or brick walls were found anywhere on this site, and the only *kachcha* walls recognized with certainty were those in the higher sections of Trench H and the room on the summit. Some of these *kachcha* bricks were $19'' \times 13\frac{1}{2}'' \times 2\frac{1}{2}''$, but it was not easy to determine all the edges of the bricks in the small room, but two sizes were noted, $12'' \times 12''$ and $18'' \times 18''$. There can be no doubt that the highest portion of the mound (Pl. II *a*), is entirely artificial and due to the former existence on the spot of either some large and important building, such as a citadel or temple, or of a number of smaller structures lasting over a considerable period. The present day Fort or Miri at Kalat gives a good idea of what the Sampur Mound might formerly have been ; a low hillock surmounted by a citadel palace, with the houses of the less important inhabitants clinging to the slopes and clustering around its base (Pl. II *d*). The settlement can never have been very large but was not the only one in the neighbourhood as the Safaid Bulandi, a very large high mound some three miles to the north, and where there is still a spring, undoubtedly marks a site of similar date.

**Large Vessels**.—The numerous large vessels recovered in all the trenches and at all levels up to a depth of $10' \ 2\frac{1}{2}''$ are the most striking feature of this excavation (Pl. II *b* and *c* and Pl. III *a* and *b*). Their number, diversity and varying levels are astonishing. Twenty-nine in all were met with, and though the greater number were badly crushed and were held together only by their earthy contents, nine were successfully strengthened interiorly by strips of cloth and glue and transported safely to the McMahon Museum, Quetta, where they are being stored. Some idea of the comparative sizes and appearance of these vessels may be gathered from Pl. II *c*. None of them were found in connection with walls or floorings, and it is uncertain whether, originally, they were buried up to the neck in floors of beaten earth or just placed on the earth. Perhaps both plans were adopted as vessel 19 in Trench E rested on a brick, one of the few recovered at this site, whereas vessels 27, 28, 29 in Trench H were dug out of beaten earth suggestive of a floor. What was the purpose of these vessels ? Were they funerary vases or merely household vessels left in the ground as the level of occupation arose ? To this no certain and absolute answer can be given, but after the most careful examination of the contents of the whole twenty-nine it appears unlikely that they were funerary vessels. The majority contained earth only, some were almost empty save for

a little fine earth, obviously the result of infiltration. Bones were, indeed, found in some of the vessels and a large broken one recovered in Trench E contained more bones than were likely to have found their way into it by accident. These were submitted for examination to Col. Deas, I.M.S., C.M.O., Baluchistan, who reported that they were all animal bones. As the mound is littered with animal bones it would be surprising if odd ones did not occasionally fall into these abandoned vessels. The few bones occasionally found in these *mats* were rarely found together, but here and there in the earthy contents, as if they had fallen in casually and not all at one time.

Were the site a neolithic one the possibility of burials in large vessels might be entertained, but not at the date to which this settlement may be assigned. These large jars were most probably used for storage. It is impossible for a semi-nomadic people, as are those of Sarawan to-day, and as were probably their predecessors, to carry with them in their wanderings their entire stores of grain and even to-day subterranean granaries are not uncommon near small village sites in the Kalat State.

Exploration of similar mounds may possibly throw further light on the purpose of these vessels, for numerous sites in Baluchistan are reported to have yielded such *mats* [1] and in the McMahon Museum at Quetta are specimens from three mounds including Mastung itself.

**Trench A.**—These vessels do not in themselves afford any certain evidence of the age of the mound but fortunately the smaller antiquities recovered at the site are more accommodating. The most striking of these is the silver cup, No. 99 (Pl. IV *a* & *b*). This was recovered in Trench A at a depth of six feet. It is $4\frac{3}{10}''$ in height and $3\frac{1}{2}''$ in diameter. For ancient silver it is well preserved and may with confidence be assigned to the beginning of the 1st Century of this era. The horizontal flutings are well known features of the bronze cups found in the Indo-Parthian stratum at Taxila [2] and it is interesting to note that precisely similar cups, with the characteristic plain top, horizontal flutings and small foot are depicted in a Graeco-Buddhist sculpture in the Guides' Mess at Mardan. [3] The only other metal object found in this trench was the bottom part of a small bronze cylindrical vessel (No. 29) 1′ 8″ in height with two narrow bands of ornament, the lower being a continuous band of connected spirals—a design also found on the handle of a copper vessel found at Taxila (Pl. IV *d* 29). The other finds in Trench A are principally earthenware objects, both wheel and hand-made, examples of which appear as Nos. 5, 8, 81 of Pl. V *b*; Nos. 27 and 32 of Pl. IV *e* and Nos. 7, 11, 23, 34 of Pl. V *d*. The drinking vessels shown on Pl. V *b* are good specimens of pottery, Nos. 5 and 8 being a reddish buff ware with a brick red

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[1] Large vessels have been found in the Quetta Miri, the Riasa Gundi mound and the Kuchlak mound in the Quetta-Pishin Districts; in the Luni mound near Sibi; in the large mound at Nushki and in *dambs* in Makran.

[2] Silver cups of this form have since been recovered at Taxila in the excavations of 1926-27.

[3] This bacchanalian scene is published by M. Foucher as *Fig. 131 L' art greco-bouddhique du Gandhāra.*

slip and polished parallel lines. These as well as No. 81 are undoubtedly of the same date as the silver cup No. 99, and have the same characteristic small foot. These vessels were found at levels varying from three to nine feet.[1]

Eight large vessels were found in Trench A, five of which are seen *in situ* in Pl. III *a*. The bases of vessels S17, S4, S1 and S2 were 10′ 2½″, 5′ 7″, 4′ 7″ and 3′ 3″ respectively below ground level and appear to mark at least three levels of occupation at this spot. The two more or less parallel lines shown on the right side of the trench appearing in Pl. III *a*, indicate a layer of charcoal.

**Trench B.**—In Trench B seven large jars were discovered all clustered together (Pl. I). Although not exactly on one level they nevertheless appear to represent one period of occupation. Finds in this trench were few and only two other antiquities were recovered, namely, a funnel-shaped earthenware object No. 43, and a fragment of a bowl of good buff ware, No. 44.

**Trench E.**—Only two large vessels were found in Trench E (Pl. I). The base of one was 5′ 9″ below ground level and the other was a few inches higher. The former contained animal bones and the terracotta ladle No. 40, (Pl. V *d*). The contents of the second vessels were very hard clay containing small flat gravel, and quite unlike the matèrial of the trench. This hard clay resembled the material of the jar itself and was probably a potter's material, the fine gravel being added as a *degraissant* in this coarse ware. Antiquities were recovered only in the east end of this trench as the western end ran over a natural rise which did not appear to have been occupied. This trench also yielded No. 63 (Pl. V *d*), wheel-made vases such as No. 38 (Pl. IV *e*), the two hand-made bowls Nos. 42 and 45 and the vase No. 41 (Pl. V *c*). This vase is crudely ornamented in red. Three pieces of a shallow dish No. 46, 1′ 0¼″ in diameter, of thick red ware with a brick red slip on both sides and having the interior decorated with ornament in black were also found in this trench. A pot-sherd of hand-made ware, No. 31, recovered very near the surface and having a buff ground decorated with circles in black and chocolate, floral forms and the head of a bird(?) is of special interest as it resembles a vase, now in the Lahore Museum, which came from Baleli near Quetta.

A fragment, No. 48, of a copper coin of Indo-Scythian type and bearing traces of Greek lettering was recovered at a depth of six feet but is unfortunately illegible. There are remarkably few records of finds of coins in Baluchistan. Money does not appear to have been largely used there in ancient days and even to-day there is little in circulation. Revenue in the Kalat State is still paid in kind and money rarely changes hands and barter is the usual means of trade. This was the only trace of a coin found at the site.

On the south side of Trench E and only a few inches underground were the remains, seemingly *in situ*, of a large vessel similar to those found in

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[1] For a complete list of finds giving find spots and depths see *Appendix A*.

other parts of the mound. If still in its original position this, when whole, must have been visible above ground, unless during the last thousand years several feet of earth have been eroded by the violent winds which blow almost daily from noon to sunset.

**Trench G.**—The large vessels found in Trench G were on two well-marked levels, the lower ones on that of the vessels in Trench B, the tops of the higher ones being but little below the surface of the ground (Pl. II *b*). Vessel No. 20 stood on earth 1′ 7″ in thickness below which three courses of *kachcha* brick could be traced. Four of these vessels Nos. 22, 23, 25, 26 appear in (Pl. II *c*). Very few antiquities were obtained in this trench but they included No. 49, part of a small bronze centaur (Pl. IV *d*), hand and wheel-made wares, a conical terracotta seal with a diagrammatic representation of an animal, No. 60, and the miniature vase No. 70 (Pl. V *a*).

**Trench H.**—But three large vessels were found in Trench H and these only in the northern half and in the lower ground. Reference has already been made to the curious shaft in the higher part of this trench which may have been a drain or grain pit. Numerous small antiquities were recovered in this trench principally in the southern and higher sections. These include the miniature vase No. 53, (Pl. V *a*), the interesting lenticular flask No. 69, (Pl. IV *e*), the handled jug No. 55, (Pl. V *b*), and No. 58, half of a large broken plate, made of buff ware with a dark red slip and decorated with incised foliated bands on both sides (Pl. III *c*). Beads of shell and terracotta, two curious objects Nos. 61 and 74, resembling modern candlesticks, No. 64, a small polished disc of limestone and hand-made and wheel-made vessels were also obtained as well as No. 68, a circular terracotta amulet pierced longitudinally and bearing a *swastika* in relief.

**Room on Top of the Mound.**—From the small room on top of the mound came the miniature vase No. 80 (Pl. V *a*), a large broken goblet No. 82, (Pl. V *b*) and No. 75, a crucible of grey hand-made ware.

A few terracotta spindle whorls, a potter's dabber, some pieces of iron and copper, grinding stones, rubbing stones, spherical pounding stones and numerous hones were recovered in various parts of the site and are detailed in the complete list of finds given in Appendix A. Only fragments of two figurines were discovered, namely, No. 6, the torso of a man and No. 26, the head of a ram.

The pottery recovered at this site varies from the coarse and crude hand-made crucibles and bowls of Pl. V *c* & *d*, to the large vessels of Pl. II *c*, and the delicate miniature vessels and fine goblets of Pl. V *a* & *b* and the striking dish No. 58, figured in Pl. III *c*. These very different wares cannot be assumed to mark different stages of culture as they were found at all levels throughout the site. They appear to be contemporary pottery meeting different needs. A collection was made of specimens of the numerous and varied potsherds lying on the surface of the mound and details of these are given in Appendices B and C.

Our operations have proved that the mound marks an ancient settlement on and adjacent to several low natural ridges and that the highest part is due to some large structure, or group of buildings built of mud brick, around which clustered smaller and simpler buildings possibly of beaten earth. Judging from the different levels at which the small antiquities and large vessels were disclosed it would appear that the site was occupied more or less continuously for a considerable period by people whose culture was relatively simple and whose household possessions were few and in no way striking. From the presence of the numerous earthenware vessels and the abundance of potsherds it may be concluded that they were not entirely nomadic and more advanced than the present inhabitants. The site must have been occupied for some considerable time before and after the Christian era and have been abandoned long before the Muhammadan invasion and never afterwards reoccupied. The antiquities recovered at this site add to our knowledge of the civilization of this region two thousand years ago and at the same time indicate that the numerous mounds near Quetta, such as those at Kuchlak and Saranan as well as the Safaid Bulandi and the Luni Mound near Sibi are probably to be assigned to the same period.

This excavation, as already stated in the Preface, was undertaken primarily in the hope of discovering some connection between the early civilization of Mesopotamia and the Indus valley. That hope not having been realized it was decided to make trial excavations at the Sohr Damb, a mound near Nāl in the Jhalawan Division of the Kalat State and some two hundred and fifty miles south of Quetta, and these operations form the subject of the next section of this Memoir.

## APPENDIX A.

*Smaller antiquities recovered in excavations at the Sampur Mound, Mastung, Baluchistan.*

3. Fragment of marble carved to resemble a conch shell. Top missing, *ht.* $1\frac{1}{2}$″. . A. 3′
4. Indefinable object of friable plaster. Ornamented with volutes. Probably an architectural fragment, *ht.* $5\frac{1}{2}$″ . . . . . . . . . . . A. 3′
5. Earthenware goblet with small base. Fine dark reddish buff ware with red slip and parallel polished lines; edge broken, *ht.* 5″. Plate V *b*. . . . . . A. 3′
6. Torso of terracotta figurine. Male figure with crossed arms. Headdress missing, *ht.* $2\frac{1}{2}$″ . . . . . . . . . . . . . . . . A. 4′
7. Roughly made cup with handle. Thick coarse hand-made ware. Ornamented inside with four lines and dots in red, *ht.* $2\frac{\ }{10}$″, *dia.* $3\frac{1}{2}$″. Plate V *d*. . . . A. 6′
8. Goblet with small base resembling No. 5. Top broken, *ht.* 7″. Plate V *b*. . A 7′
9. Goblet with small base similar to No. 8 but greyish brown ware with darker polished line. Top broken, *ht.* $6\frac{3}{10}$″ . . . . . . . . . . . . A. 7′
10. Terracotta goblet similar to No. 5 with base missing and rim broken, *ht.* $5\frac{3}{10}$″ . . A. 7′
11. Small earthen basin. Hand-made coarse ware, *ht.* $2\frac{3}{10}$″, *dia.* $2\frac{1}{4}$″. Plate V *d*. . . A. 7′
12. Lenticular earthen flask. Spout missing. Upper surface divided by double black line into quadrants, *dia.* $3\frac{8}{10}$″. *cf.* Nos. 66, 69. . . . . . . A. $6\frac{1}{2}$′
13. Limestone hone, length 6″ . . . . . . . . . . . . . A. 7′
14. Limestone hone, length 5″ . . . . . . . . . . . . . A. 7′
15. Limestone hone, length 5″ . . . . . . . . . . . . . A. 7′
16. Limestone hone, length $4\frac{1}{2}$″ . . . . . . . . . . . . . A. 7′
17. Small limestone hone with hole at one end, length $2\frac{1}{2}$″ . . . . . . A. 8′
18. Semicircular fragment of terracotta lid or plate. Two parallel incised lines near the outer edge and circular floral design in centre enclosed by a cable ornament. Three petals of the central ornament preserved, *dia.* $8\frac{7}{10}$″ . . . . . A. 7′
19. Potter's dabber, *ht.* $2\frac{4}{10}$″ . . . . . . . . . . . . .
20. Small vase with narrow mouth and everted brim. Wheel-made ware with brick red slip on upper half and inside brim, *ht.* 3″, *dia.* $3\frac{1}{2}$″, *dia.* of mouth 2″ . . A. 6′
21. Broken terracotta vessel resembling in shape a modern tumbler. Similar ware to No. 5 only thicker. Top edge missing, *ht.* $4\frac{8}{10}$″, *dia.* of base $2\frac{4}{10}$″, *dia.* of mouth 4″ A. $7\frac{1}{2}$′
22. Flask of hand-made red ware with narrow mouth not in the centre. Near neck a roughly made *swastika(?)*, *ht.* $4\frac{2}{10}$″, *dia.* $5\frac{4}{10}$″, *dia.* of mouth $1\frac{1}{10}$″. . . . . A. 7′
23. Coarse hand-made squat vessel of greenish buff earthenware. Traces of brown ornament, *ht.* $1\frac{8}{10}$″, *dia.* $2\frac{5}{8}$″. Plate V *d*. . . . . . . . . A. 7′
24. Cylindrical earthenware tube pierced with 12 holes, *ht.* $5\frac{8}{10}$″ . . . . . A. 8′
25. Indefinable object of coarse grey earthenware. Upper surface shaped like a saddle. Hole on either side, *ht.* $3\frac{1}{10}$″ . . . . . . . . . . A. 7′
26. Ram's head, terracotta, *ht.* 2″ . . . . . . . . . . . . A. 8′

## APPENDIX A—*contd.*

*Smaller antiquities recovered in excavations at the Sampur Mound, Mastung, Baluchistan*—contd.

27. Small earthenware vase with hole in the side marking lost spout, *ht.* $2\frac{8}{10}''$, *dia.* $3\frac{2}{10}''$. Plate IV *e*. . . . . . . . . . . . . A. 6′

28. Fragment of large freshwater mussel shell, lt. 2″ . . . . . . A. 7′

29. Bronze cylindrical casket, *ht.* $1\frac{8}{10}''$, *dia.* of base $2\frac{3}{10}''$, interior *dia.* 2″. Has projecting edge for now lost cover. Band of projecting ornament both at the top and bottom, the former a simple incised pattern $\frac{3}{10}''$ wide, the latter $\frac{3}{10}''$ to $\frac{4}{10}''$ wide with a continuous band of connected spirals. Plate IV *d* . . . . A. 8′

30. Goblet resembling No. 5 ; base lost and rim damaged, *ht.* 6″ . . . . E. 1′

31. Fragment of decorated pottery, coarse fabric. A yellowish buff ground with circles in black and chocolate lines, floral forms and head of a bird (?). *ht.* $5\frac{1}{4}''$. Resembles a vessel in the Lahore Museum said to come from near Quetta . . E. 1′

32. Miniature bulbous vase with narrow base and very small mouth. Good red ware and in excellent preservation. Foot slightly damaged, *ht.* $3\frac{1}{4}''$, *dia.* of base $\frac{9}{10}''$, *dia.* $2\frac{3}{10}''$, *dia.* of mouth $\frac{3}{10}''$. Plate IV *e* . . . . . . . . A. 9′

33. Small earthenware plate or lid, *ht.* $\frac{1}{2}''$, *dia.* $2\frac{3}{10}''$ . . . . . . . . E. 4′

34. Coarse shallow vessel ; hand-made greyish fabric with wide mouth and narrow base. Has a line of small impressed holes near the base, *ht.* $2\frac{2}{10}''$, *dia.* $2\frac{1}{2}''$. Plate V *d* A. 9′

35. Convex earthenware lid with chevron ornament on edge, *dia.* $2\frac{1}{2}''$ . . . . . G. 2″

36. Crude circular vessel, hand-made and resembling No. 34 in fabric. Found inside a large broken vessel in Trench A, *ht.* $2\frac{6}{10}''$, *dia.* $4\frac{1}{10}''$ . . . . . . A. 5′

37. Whitish limestone rubbing stone, *silwatta*. One side flat, the other three slightly convex, lt. 4.″ . . . . . . . . . . . . . . E. 4′

38. Small bulbous vessel of red earthenware. Mouth damaged, *ht.* $2\frac{}{10}''$, *dia.* of base $1\frac{4}{10}''$, *dia.* $2\frac{9}{10}''$. Plate IV *e* . . . . . . . . . . E. 4′

39. Terracotta disc with hole in centre, *dia.* $1\frac{2}{10}''$, thickness $\frac{2}{10}''$ . . . . E. 5′

40. Ladle of hand-made earthenware, *lt.* $4\frac{1}{4}''$. Found in the large broken vessel in Trench E. Plate V *d* . . . . . . . . . . . E. 5′ 9″

41. Vase of hand-made earthenware, with crude ornament in red. Rim damaged, *ht.* $7\frac{4}{10}''$, *dia.* of mouth 4″. Plate V *c* . . . . . . . . . . E. 5′ 9″

42. Bowl. Plain coarse hand-made ware. Rim broken, *ht.* $5\frac{1}{4}''$, *dia.* $10\frac{6}{10}''$. Plate V *c* E. 5′ 9″

43. Funnel-shaped earthenware object, *ht.* 9″, *dia.* of narrow end $1\frac{6}{10}''$. Ornamented with pairs of parallel incised lines and one line below brim. Both ends damaged B. 7′ 6″

44. Fragment of bowl of good buff ware. Outer rim has dark chocolate slip, inside traces of dark red slip, *ht.* $3\frac{1}{2}''$, *dia.* 7″ . . . . . . . . . . B. 6′

45. Bowl. Hand-made ware. Complete but damaged, *ht.* $4\frac{4}{10}''$, *dia.* of mouth $9\frac{1}{2}''$. Plate V *c* . . . . . . . . . . . . . . E. 6′

46. Shallow ornamented dish. Broken into three pieces and incomplete. Has red slip on both sides. Black band on brim and interior decorated with circular patterns in black lines, *ht.* $1\frac{6}{10}''$, *dia.* 1′ $\frac{1}{4}''$ . . . . . . . . E. 6′

47. Thin lid of fine red ware. Black line on edge. Slightly convex, *dia.* $2\frac{7}{10}''$ . . . E. 6′

48. Fragment of bronze coin (?) seems to have traces of Greek characters but nothing legible. . . . . . . . . . . . . . . . E. 6′

## APPENDIX A—*contd.*

*Smaller antiquities recovered in excavations at the Sampur Mound, Mastung, Baluchistan*—contd.

49. Broken bronze centaur. Very badly corroded and with head and two legs missing, *ht.* $1\frac{7}{10}''$. Plate IV *d* . . . . . . . . . . . . G. 5′
50. Roughly spherical shell bead, *dia.* $\frac{4}{10}''$ . . . . . . . . . . H. 0′ 9″
51. Crude crucible-like vessels of coarse hand-made ware. Black with grey exterior which is now peeling, *ht.* $2\frac{1}{10}''$, *dia.* of mouth $1\frac{8}{10}''$, *dia.* $2\frac{6}{10}''$. *Cf.* 71, 75 . E. 7′ 6″
52. Small oval vessel of reddish buff hand-made ware, *ht.* $1\frac{6}{10}''$, *dia.* of mouth 1″, *dia.* $1\frac{6}{10}''$ . . . . . . . . . . . . . . . E. 7′ 6″
53. Miniature vase of elegant form, *ht.* $2\frac{3}{10}''$, *dia.* 2″. *Cf.* Nos. 70, 80. Plate V *a* . H. 1′ 6″
54. Curiously shaped vessel, something like a teapot, but with one side higher than the other. Seems to have had a spout but this is now lost. On top two small projections. Round the spout opening circular ornament. Buff ware with maroon slip, *ht.* $3\frac{3}{10}''$, *dia.* $3\frac{9}{10}''$ . . . . . . . . . . H. 3′
55. Handled jug of buff ware with chocolate slip on exterior and inside mouth. Raised parallel lines round greatest diameter. Mouth damaged and handle chipped, *ht.* $5\frac{3}{10}''$, *dia.* $3\frac{9}{10}''$. Plate V *b* . . . . . . . . . . H. 2′ 6″
56. Small jar. Exterior blackened in places, mouth damaged, *ht.* $3\frac{3}{10}''$, *dia.* $3\frac{2}{10}''$ . E. 7′
57. Barrel shaped terracotta bead, *lt.* $1\frac{6}{10}''$, *dia.* $\frac{8}{10}''$ . . . . . . . H. 4′
58. Four fragments of a shallow dish. Greyish ware with reddish chocolate slip on both sides. Turn over brim. Interior decorated with three parallel bands of incised conventional ornament, one on the brim, two in the base of the dish. Two raised parallel rings in the centre. Underside with incised patterns, and ornamented star, having in the centre several concentric circles. Two wavy lines on outer edge, *ht.* $1\frac{1}{10}''$, *dia.* 14.″ Plate III *c* . . . . . . H. 4′ 3″
59. Fragment of large sea shell with eleven small incised circles $\frac{1}{8}''$ in *dia.* $3\frac{3}{10}'' \times 2\frac{8}{10}''$ H. 4′
60. Conical terracotta seal. Pierced for suspension. Sealing seemingly a diagrammatic representation of some animal (horse ?) *ht.* $1\frac{4}{10}''$, *dia.* $1\frac{3}{10}''$ . . . . G. 5′
61. Terracotta object resembling a modern candle stick. May have been a lid. Dark buff ware with red slip. The neck pierced with two holes as if for suspension, *ht.* $1\frac{4}{10}''$, *dia.* $3\frac{9}{10}''$. *Cf.* No. 74 . . . . . . . . . . H. 4′
62. Earthen vessel badly affected by salt. Chocolate slip on exterior, *ht.* $6\frac{2}{10}''$, *dia.* $6\frac{4}{10}''$, *dia.* of mouth $4\frac{1}{10}''$ . . . . . . . . . . . . H. 4′ 9″
63. Hand-made earthen vessel resembling a crucible. Reddish buff ware, *ht.* $2\frac{4}{10}''$, dia. $2\frac{1}{2}''$ Plate V *d* . . . . . . . . . . . E. 5′ 6″
64. Disc of well polished grey limestone. Pierced in the centre. One edge chipped, *dia.* $1\frac{1}{2}''$, thickness $\frac{2}{10}''$ . . . . . . . . . . . H. 3′
65. Earthenware object, possibly a toy. More or less lenticular with small conical projection on the upper side and a hole which seems to mark a similar smaller projection. Buff colour with simple ornament consisting of a black line on the upper edge and two rings round the base of the projections one of which is damaged, *ht.* 2″, *dia.* $2\frac{1}{2}''$. Plate V *d* . . . . . . . . . H. 3′ 9″
66. Lenticular flask. Hand-made. Hole marking position of now lost spout, *ht.* $1\frac{6}{10}''$, *dia.* $2\frac{1}{2}''$-$2\frac{3}{4}''$. *Cf.* Nos. 12, 69 . . . . . . . . . G. 6′ 4″

## APPENDIX A—*contd.*

*Smaller antiquities recovered in excavations at the Sampur Mound, Mastung, Baluchistan*—contd.

67. Terracotta lid with knob in the centre. Good red ware, *ht.* $\frac{7}{10}''$, *dia.* $2\frac{8}{10}''$ . . G. 4′

68. Terracotta ornament, roughly circular, pierced with hole on either edge. Shows in relief a *swastika* enclosed in a square with a projection on each side between the arms of the *swastika*. At first sight looks like a seal but this is improbable as it would be awkward to handle and moreover gives a poor impression and is in relief. It gives signs of wear and has probably been worn as an amulet, *dia.* $1\frac{2}{10}''$. . . . . . . . . . . . . H. 3′

69. Lenticular vessel resembling Nos. 12, 69 but complete with spout on one side, *ht.* excluding spout $1\frac{4}{10}''$, length including spout $3\frac{3}{10}''$, *dia.* 3″. Plate IV *e*. . H. 4′

70. Miniature vase of pleasing form. In four pieces, damaged, but repaired, and with parts still missing, *ht.* 3,″ *dia.* $1\frac{8}{10}''$. *Cf.* Nos. 53, 80. Plate V *a* . . . . G. 6′ 6″

71. Small crucible with small hole and spout on one side. Black ware, *ht.* $1\frac{2}{10}''$, *dia.* $1\frac{7}{10}''$, *dia.* of mouth $1\frac{3}{10}''$. *Cf.* Nos. 51, 75 . . . . . . . . . G. 5′ 6″

72. Small terracotta vessel. Red ware, *ht.* $1\frac{9}{10}''$, *dia.* $2\frac{6}{10}''$, *dia.* of mouth 1″ . . H. 4′

73. Fragment of greyish ware, dark grey slip ; pierced with hole at either end *lt.* $5\frac{3}{4}''$ . H. 4′ 6″

74. Small earthenware object resembling No. 61 and similarly provided with two holes for suspension, *ht.* 1″, *dia.* $2\frac{7}{10}''$ . . . . . . . . . H. 1′

75. Hand-made crucible with small hole in the side, *ht.* $1\frac{7}{10}''$, *dia.* $2\frac{4}{10}$,″ *dia.* of mouth $1\frac{9}{10}''$. *Cf.* Nos. 51, 71 . . . . . . . . . . Room 4′ 6″

76. Small crucible of grey ware, *ht.* $1\frac{6}{10}''$, *dia.* $1\frac{6}{10}''$, *dia.* of mouth $1\frac{2}{10}''$ . . . H. 5′

77. Shallow dish of plain red ware. Edge rough. Finger impression in centre, *ht.* $\frac{7}{10}$,″ *dia.* $3\frac{8}{10}''$ . . . . . . . . . . . . . . . H. 5′

78. Small lid of red ware with knob, *ht.* $\frac{9}{10}''$, *dia.* $2\frac{1}{2}''$ . . . . . . . H. 5

79. Circular terracotta object with hole, $2\frac{1}{2}''$ *dia.* through the centre. Lower surface flat, but upper is raised round the hole and has grey slip like the edge. Thickness $\frac{8}{10}''$, *dia.* $5\frac{1}{2}''$ . . . . . . . . . . . . . . H. 4′

80. Miniature vase resembling Nos. 53, 70, *ht.* $2\frac{3}{10}''$. Plate V *a* . . . . . Room 6′

81. Large goblet with foot. Buff ware with reddish slip on the exterior and inside brim. Has two parallel incised lines near the brim $\frac{3}{10}''$ apart and one slightly raised line $1\frac{8}{10}''$ below the brim, *cf.* No. 82. Half of the upper portion lost, base has been repaired. Side also damaged, *ht.* $5\frac{3}{10}''$, *dia.* of mouth $5\frac{6}{10}''$, *dia.* of base 2″. Plate V *b* . . . . . . . . . . . . . . A. 6′ 6″

82. Goblet resembling No. 81. Buff ware with brownish grey slip on exterior and inside brim. Half of bowl missing and other part has been repaired, *ht.* 5″, *dia.* 5″, *dia.* of base $1\frac{7}{10}''$. Plate V *b* . . . . . . . . . . Room 8′ 6″

83. Miniature vase, *ht.* $2\frac{1}{2}''$. Found together with Nos. 84, 85, 95 subsequent to the excavations being revealed by a subsidence due to rain. Plate V*a* . . A

84. Hand-made vessel, red ware, straight neck, *ht.* $2\frac{6}{10}''$ . . . . . . A

85. Hand-made pear-shaped vessel. Buff ware. Line of incised chevron below neck. Rim broken, *ht.* $3\frac{1}{4}''$ . . . . . . . . . . . . A

86. Fragment of straight sided vessel with everted brim. Red ware with buff slip inside and outside, *ht.* $6\frac{3}{4}''$ . . . . . . . . . . . ...

## APPENDIX A—*concld.*

*Smaller antiquities recovered in excavations at the Sampur Mound, Mastung, Baluchistan*—concld.

87. Fragment of drinking cup resembling No. 5, *ht.* $4\frac{1}{2}''$ . . . . . . . . ..
88. Fragment of drinking cup resembling No. 5, *ht.* $3\frac{1}{2}''$ . . . . . . . . ..
89. Fragment of drinking cup resembling No. 5, *ht.* 3″ . . . . . . . . ..
90. Spindle whorl, terracotta, *dia.* $1\frac{1}{2}''$ . . . . . . . . . . . ..
91. Spindle whorl, terracotta, *dia.* $1\frac{1}{4}''$ . . . . . . . . . . . ..
92. Fragment of flat stone. $1\frac{4}{10}''$ with hole, *dia.* $\frac{3}{8}''$ on one side into which something appears to have been screwed . . . . . . . . . . . . ..
93. Fragment of miniature terracotta shaft of pillar, *ht.* $3\frac{3}{4}''$, face of shaft 1″. On end of shaft four little raised circles . . . . . . . . . . . . ..
94. Fragment of little circular shaft with similar ornament of raised rings, *ht.* 3″ . . ..
95. Small crystal bead. Facetted and having fourteen faces; found with Nos. 83-85, *dia.* $\frac{3}{8}''$. Very fine hole . . . . . . . . . . . . . . A
96. Nine corroded fragments of copper including beads, and wire . . . . . A
97. Fragments of glass, shell, and a marble bead . . . . . . . . . . A
98. Two pieces of iron $2\frac{1}{2}''$, $3\frac{1}{2}''$. The larger piece has a projecting lug . . . . A
99. Silver cup. *Ht.* $4\frac{1}{4}''$, *dia.* of foot $1\frac{2}{10}''$, *dia.* of mouth $3\frac{1}{2}''$. Below one-third of the height where the cup attains its greatest diameter ten parallel flutings. Indo-Parthian period. Noticeably small foot. Resembles in this the earthenware cups, Nos. 5, 8, 9, etc. Plate IV *a, b* . . . . . . . . . . . A. 6′

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## APPENDIX B.

*Decorated Potsherds from the Sampur Mound, Mastung, Baluchistan.*

Numerous specimens of decorated pottery were found all over the mound, and of these a large collection was made. The specimens recovered fall into nine main classes.

D.—I.(*a*) Thickish ware from $\frac{1}{2}''$. Always broken with an irregular edge. Has a rough biscuit-like fracture. Probably wheel-made but not particularly well-shaped. Linear design in dark red, black and buff but no specimen large enough to be analysed. Good specimens are very smooth to the touch. The majority of the specimens have ornament on both sides and were probably part of shallow dishes or open mouthed vessels.

No complete painted vessel of this type has been recovered in the excavations and not even a large fragment—(36 specimens).

D.—II.(*a*) Roughly made buff coloured ware $\frac{3}{10}''$ with dark red and black ornament in circular designs. Seemingly wheel-made—(2 specimens).

(*b*) Similar to D.—II(*a*) but rougher in fabric and reddish in colour. Interior rough—(3 specimens).

D.—III.(*a*) Coarse red ware $\frac{3}{10}''$ small fragments of gravel of broken earthenware as *degraissant* in the mass. Light grey with vermilion bands and black linear patterns—(2 specimens).

## APPENDIX B—*contd.*

*Decorated Potsherds from the Sampur Mound, Mastung, Baluchistan*—contd.

D.—IV.(*a*) A fine homogeneous ware like pinkish and grey sandstone, $\frac{3}{10}$"—Colours faint red, black, maroon and brown. Patterns simple lines and swags and bands of colour. Decoration on one side only—(9 specimens).

D.—V.(*a*) Thick fabric $\frac{8}{10}$"—apparently fragment of large vase. Purplish chocolate with black linear patterns. Decoration one side only—(1 specimen).

(*b*) Similar to D.—V (*a*) but thinner $\frac{3}{10}$". Seemingly from smaller vessels. Purplish chocolate with black lines, dots, etc.—(2 specimens).

(*c*) Fragment $\frac{4}{10}$" resembling in fabric D.—I. (*a*). Edge of some vessel painted on both sides. Inner side purplish chocolate and black as in D.—V(*a*) and (*b*). Exterior pale buff with black. Has affinities with both D.—I(*a*) and D.—V. (*a*).—(1 specimen).

(*d*) Finer ware than D.—V. (*a*), (*c*), $\frac{2}{10}$". Ornament of black lines bands and scrolls on a pinkish ground. The fragment is the top of a small shallow dish—(1 specimen).

(*e*) Stone-like ware $\frac{1}{2}$". One side only decorated. On pale grey base, triangles, and diamonds with black hatching. Large specimen shows double lines of maroon—(2 specimens).

D.—VI.(*a*) Hand-made coarse ware with maroon colouring and raised band of swags—(1 specimen).

D.—VII.(*a*) Heavy coarse ware. On pale buff ground red ornament. Interior not very well shaped. Fragment part of some large vessel—(1 specimen).

D.—VIII.(*a*) Thick coarse fabric $\frac{1}{2}$". Hand-made. Yellowish ground with black and chocolate lines in circular, floral and animal forms (bird ?). The only specimen recovered is No. 31 in the List of Antiquities, Appendix A, which was found only one foot underground. Ornament in general resembles D.—II(*a*), (*b*).

D.—IX. Fine ware. Fragment of small vessel. Buff with wavy vermilion line between black comma-like ornament—(2 specimens).

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## APPENDIX C.

*Plain wares from the Sampur Mound, Mastung, Baluchistan.*

Coarse—

I.—1. Thick coarse wheel-made ware, with small fragments of flattish gravel used as a *degraissant* in the texture. Sometimes $\frac{8}{10}$ thick. Has frequently a cable moulding. Used for large vessels. Occasionally has a pale buff slip. Vessel 18 Trench E contained a mass of very hard clay exactly resembling this fabric and may have been a potter's vessel containing his material. Apparently a local product.

2. Similar ware to I.—1 but ornamented with bands of parallel incised lines, between bands of wavy lines. No complete vessel recovered.

Red—

II.—1. Fine red ware $\frac{3}{10}$ with ribbed surface. Sometimes both surfaces ribbed. Grey slip on *interior*. Upper edges of vessels have wavy incised lines or lines of incisions. No vessel of this type discovered.

2. Similar to above with grey slip on exterior and dark chocolate slip interior.

## APPENDIX C—*contd.*

*Plain wares from the Sampur Mound, Mastung, Baluchistan*—contd.

Red—

III.—Thick ware, $\frac{5}{10}$ but of fine texture. Grey slip both sides. Seemingly wide bowls of elegant shape. Wheel made. No complete specimen.

Red—

IV.—1. Red ware $\frac{3}{10}$—exterior grey slip, shallow dish.

2. Red ware $\frac{3}{10}$—exterior grey slip, incised lines and pattern of rings and lines. Large vessel.

3. Red ware $\frac{2}{10}$—exterior grey slip, incised wavy line. Small holes below rim as if for suspension.

4. Red ware $\frac{3}{10}$—exterior grey slip. *Stamped patterns* which have affected the shape of the vessel.

Red—

V.—1. Red ware $\frac{3}{10}$. Maroon slip on exterior and inside brim.

2. Red ware $\frac{4}{10}$. Red slip exterior. Wavy lines between incised parallel lines. Also incised paralled vertical lines.

3. Fine red ware $\frac{2}{10}$. Brown slip on exterior and inside brim.

4. Red ware $\frac{2}{10}$. Brick red slip on both sides.

5. Fine reddish chocolate ware $\frac{2}{10}$. Maroon slip on both sides.

6. Red ware $\frac{3}{10}$. Grey slip interior. Incised wavy lines alternating with incised parallel lines. *Cf.* 1.

7. Red ware $\frac{4}{10}$. Dark grey slip exterior and parallel incised lines.

8. Red ware $\frac{4}{10}$. Maroon slip on both sides. Shallow plate.

9. Red ware $\frac{4}{10}$. With three parallel deeply incised lines on upper edge of bowl.

10. Red ware $\frac{3}{10}$. Darker red slip and incised wavy line.

11. Fine red ware with thin grey slip. Several miniature vessels of this were recovered. *Cf.* No. 70. List of finds, Appendix A.

Buff—

VI.—1. Fine buff ware $\frac{1}{10}$. Exterior red slip and polished line. Characteristic of ware used for goblets. Almost complete examples Nos. 5, 8, 10 of List of Finds. Variations in chocolate. *Cf.* VI-6.

2. Buff ware $\frac{3}{10}$. Fine parallel incised lines and red slip.

3. Buff ware $\frac{3}{10}$. Chocolate brown slip on exterior and edge of brim.

4. Buff ware $\frac{2}{10}$. Chocolate slip both sides.

5. Buff ware $\frac{2}{10}$. Ribbed exterior, interior lines well marked. Chocolate slip exterior.

6. Buff ware $\frac{2}{10}$. Reddish chocolate slip with polished lines on exterior. *Cf.* VI-1.

7. Fine buff ware $\frac{3}{20}$. Reddish chocolate slip on both sides. Rough sandy surface.

8. Buff ware $\frac{2}{10}$. Brick red exterior slip, lighter slip inside.

8.(*a*) Buff ware $\frac{2}{10}$. Vermilion slip both sides.

9. Buff ware $\frac{3}{10}$. Light brown exterior slip.

10. Fine buff ware $\frac{2}{10}$. Mole coloured slip and polished line exterior. *Cf.* VI.—1, VI.—6.

11. Buff ware $\frac{2}{10}$. Black slip and polished line. *Cf.* VI-1, 6, 10.

12. Buff ware $\frac{3}{10}$. Mole slip.

## APPENDIX C—*contd.*

*Plain wares from the Sampur Mound, Mastung, Baluchistan*—contd.

13. Buff ware $\frac{3}{10}$. Red slip both sides, brighter than VI-8.
14. Buff ware $\frac{3}{20}$. Dark chocolate slip with polished line exterior.
15. Buff ware $\frac{4}{10}$. Appearance of sandstone. Dark chocolate-red slip exterior.
16. Buff ware $\frac{2}{10}$. With *stamped patterns* (conventional tree ?) *Cf.* IV-4.
17. Buff ware $\frac{3}{10}$. Grey slip both sides.

17.(*a*) Buff ware $\frac{3}{10}$. Grey slip both sides with wavy lines and lines of incisions.

18. Buff ware $\frac{3}{20}$. Greyish fawn slip exterior.
19. Buff ware $\frac{1}{10}$-$\frac{3}{10}$. Grey slip exterior, vermilion interior. Brown on rim.
20. Buff ware $\frac{2}{10}$. Grey slip both sides.
21. Fine buff ware $\frac{2}{10}$. Light brown slip on exterior and rim (possibly exterior). Hole one inch below rim possibly for suspension. *Cf.* IV-3.
22. Buff ware $\frac{3}{10}$. Grey slip exterior, chocolate interior.
23. Buff ware $\frac{4}{10}$. Chocolate slip and incised parallel lines with wavy lines below. *Cf.* I.—1.
24. Buff ware $\frac{4}{10}$. Bright red slip on upper exterior with chequers of incised lines below on grey slip.
25. Buff ware $\frac{3}{10}$. Light chocolate slip with incised parallel and wavy lines. *Cf.* VI-23.
26. Fine buff ware $\frac{2}{10}$. Sepia slip exterior and brim with polished line and faint chequered polished lines just below brim. Similar to VI-1, VI-10 save in colour.
27. Buff ware $\frac{2}{10}$. Dark chocolate slip on exterior and splashes of colour interior. *Cf.* VI-4.
28. Buff ware $\frac{5}{10}$. Reddish brown slip, interior (possibly also exterior originally) with polished line.
29. Buff ware $\frac{2}{10}$. Red slip interior, reddish brown exterior.
30. Buff ware $\frac{1}{10}$. Fine texture. Black slip both sides now worn to greyish.
31. Buff ware $\frac{3}{10}$. Corduroy exterior with pale reddish brown slip. *Cf.* VI-5.
32. Buff ware $\frac{3}{10}$. Grey slip interior, yellowish buff exterior.

Grey—

VII.—1. Light grey ware $\frac{1}{10}$-$\frac{3}{20}$.

2. Light grey ware $\frac{3}{10}$.
3. Light grey ware. Wavy incised line $\frac{4}{10}$.
4. Dark grey ware with parallel incised lines $\frac{3}{10}$.
5. Light grey with purplish chocolate slip exterior and incised parallel lines $\frac{3}{10}$.
6. Grey ware with dark grey slip exterior and black slip inside brim $\frac{2}{10}$.
7. Light grey ware. Parallel incised lines and dots $\frac{2}{10}$.

Grey and greenish Grey—

VIII.—1. Green ware. Traces of black line on lower edge of brim $\frac{3}{20}$.

2. Greenish grey ware $\frac{2}{10}$.

Dark Buff and Reddish Brown—

IX.—1. Reddish brown ware. Dark maroon slip both sides. Parallel polished lines interior. *Cf.* VI-14.

Pinkish—

X.—1. Pinkish ware, fine fabric. Traces of brown lines exterior $\frac{2}{10}$.

2. Pinkish ware. Similar to X-1, but having grey slip on both faces. Unevenly fired.

## APPENDIX C—*concld.*

### *Plain wares from the Sampur Mound, Mastung, Baluchistan*—concld.

XI.—1. Unevenly fired ware. Reddish edges and buff interior. Grey slip with wavy line exterior. Dark greyish black slip on rim and interior of brim $\frac{3}{10}$.

2. Unevenly fired ware. Reddish edge, grey interior. Red slip both sides $\frac{4}{10}$.

3. Unevenly fired ware. Corduroy interior with dark red slip $\frac{3}{10}$.

XII.—1. One fragment only of thick reddish wareof pinkish sandy texture having *chevrons in relief on rim* $\frac{5}{10}$.

Black—

XIII.—1. Black ware $\frac{2}{10}$. Incised elaborate pattern exterior.

## EXCAVATIONS AT NĀL.

In the Annual Report of the Archæological Survey of India for the year 1904-05 Sir John Marshall described a new type of pottery recovered from a mound known as the Sohr Damb, near Nāl[1] in the Jhalawan Division of the Kalat State. As this pottery was of unique type and the mound had never been examined by an archæologist it was decided to make trial excavations there in order to ascertain exactly in what circumstances this interesting ware was found and, if possible, to unearth along with it some other class of antiquities which might throw light upon its purpose, origin and date, and the civilization to which it might be ascribed.

Jhalawan is for the most part, broken and mountainous, being intersected here and there by valleys of varying width. The Nāl valley is about 30 miles in length with an average breadth of seven miles, and the little village of Nāl lies in Lat. 27° 40′ N. and long. 66° 48′ E. and 3,834 feet above sea level.[2] The place is of some importance as it commands several of the principal routes in the country.

Considerable difficulty was experienced in obtaining even in Baluchistan exact information concerning the position and condition of the mound. The description of the Sohr Damb given in the Archæological Report for 1904-05 on the authority of the Gazetteer official is entirely misleading. Far from being thirty feet high with a diameter of fifty feet it proved to be a very large mound 1,016 feet in length and 600 feet at its widest part, Plate IX*a* & *b*. It lies too, not a mile and half to the north-east of Nāl but some four or five miles to the east. Moreover there are no other mounds in the immediate vicinity and it can only be imagined that either the gazetteer officer's memory was at fault or that he must have considered the undulations of the surface as marking separate mounds, for there are none of the "five other mounds of the same description within a radius of 150 yards from the Sohr Damb" of which he makes mention.

Concerning this same mound the Local Administration furnished the following information received from the then Assistant Political Agent, Jhalawan.

> "The Sohr *Damb* at Nāl, Jhalawan, was completely excavated in 1908 by the Hazara Pioneers under the command of Colonel (now General Sir Claud) Jacob and whatever few specimens they could obtain were removed. The Bizanjau Sardar in whose jurisdiction the ruin exists assures me that no more specimens of pottery could be got from this ruin."

In the face of that information it required no small optimism to organize an expedition to this remote and little accessible site which, on the one hand was reported to be only fifty feet in diameter and, on the other, to have

[1] *A. S. I. 1904-05, p. 105, Pl. XXXIII, XXXIV.*
[2] *Jhalawan Gazetteer, p. 220.*

been completely excavated, and it was with considerable trepidation we made the long trek to Nāl. How little reliable was that information and to what degree our optimism was justified will be plain from the sequel.

The Sohr *Damb* is a conspicuous object for miles around and is by far the largest mound in the vicinity of Nāl. Its main axis runs north-east and south-west and the mound attains its maximum height of some forty feet towards its southern end. It is covered with small stones and potsherds but when these are removed greyish buff earth resembling the material of decayed mud walls is everywhere visible. Towards the southern end the highest part of the mound has undoubtedly been subjected to great heat and the material is baked to a red colour and it is doubtless to this burnt area that it owes its name of Sohr *Damb*, the Red Mound. Its ruddy appearance was very noticeable when riding towards it from Nāl on the evening of our arrival.

Cultivation extends up to the edges of the mound. The adjacent fields are unirrigated, so earth is not dug from the mound to be used as manure. On the north-east, west and south sides, however, cuttings had been made to provide channels to bring rain water from the higher ground on the north to the embanked fields on the south. The excavations on the north-west were extensive and had entirely separated one portion of the mound, Pl. VI.

According to a very old workman employed on our excavation the original water channel was small but flood water gradually deepened it and an exceptionally heavy shower exposed rows of earthenware vessels and thus first revealed to the villagers their presence within the mound.[1]

Acting upon this knowledge Mirza Sher Muhammad of the Gazetteer staff excavated a small area in 1903 and recovered the fifty-nine pieces described by Sir John Marshall and to which reference has been already made.

But the most extensive excavations at this site were those carried out in 1908 by the Hazara Pioneers under the command of Colonel (now Field-Marshal Sir Claud) Jacob when some two hundred and fifty vessels are said to have been obtained and divided into five lots, one of which went to the McMahon Museum, Quetta, the others being shared by the officers who participated in the work. Other antiquities were also recovered but no record of these was prepared and unfortunately no information concerning them or the operations themselves is now forthcoming.

Some time in 1923 or 1924 the Bizanjau Sardar excavated a few vessels and these were with the Political Agent of Kalat in Quetta in March 1925. They were of interesting types but owing to faulty packing had all been broken in their long journey from Nāl. It was suggested that they be sent to the McMahon Museum, Quetta.

It has been necessary to refer to these earlier excavations not only because they had yielded the first antiquities obtained from the Sohr Damb but because

[1] *Cf. Delegation en Perse. Tome VIII, p. 72*, where the digging of an irrigation channel revealed complete vessels at Tepe Khazineh.

they had to some extent disturbed the site and confused the strata and, in no small measure, influenced the direction and extent of our operations.

Nāl was reached from Mastung on April 30th, 1925 but when it was discovered that the Sohr *Damb* was some five miles away the camp was removed to the foot of the mound near the little hamlet of Gumbadi, which consists of a dozen or so mud huts but where, fortunately, is a small, deep well of excellent water. May 1st was spent in moving the camp but the work was started next day with fifteen men and boys. Our arrival coincided most unfortunately with the reaping of the scanty wheat crop and it was with difficulty labour could be obtained, for the population of Jhalawan averages only ten to the square mile, while there is only one village in about seventy square miles and most of the people still cling to their nomadic habits. The labour procurable was not of very good quality being the local Brahuis whose extreme ignorance, according to the Gazetteer, is proverbial in the countryside. "If you have never seen ignorant hobgoblins and mountain-imps, come and look at the Brahui." This is a hard saying and was not confirmed by our experience, but the workmen were far from energetic and it was difficult to make them understand that antiquities were not to be snatched from the earth as soon as espied. Three or four of the more intelligent were gradually trained to work well with knives and by the end of the month became quite valuable assistants. The want of labour and the necessity for constant and very close supervision necessarily restricted the extent of our operations. It however enabled detailed attention to be given to every find and its provenance and of the 271 vessels discovered 240 were recovered in almost perfect condition.

A preliminary survey of the mound made it quite clear that it was artificial. Traces of stone walls were visible here and there on the surface and in one place where rain had cut a small channel the face of a line of mud bricks $12'' \times 12'' \times 7\frac{1}{2}''$ was already disclosed. Evidences of the previous excavations were plain. The Pioneers had dug a narrow winding trench low down on the western slope of the mound and at the end made a deep cut into the side. It was assumed that this deep digging indicated the spot where they had been most successful. The section made by this cutting revealed layers of light reddish material alternating with bands of ashes and charcoal and bore a striking resemblance to the ancient brick kilns so common around Lahore. As fragments of polychrome pottery were abundant close to this excavation and very rare elsewhere, it was presumed they were due to the operations of the Pioneers and had come from some deep stratum.

## Area A.

Work was started on the west side close to the former excavations and it was here the most important discoveries were made, Pls. VI, VII. This spot was chosen since it was in this area that finds had already been made

and because if, as already suspected, the polychrome vessels were funerary vases it was unlikely they would be found all over the site, which, from superficial indications, did not appear to have been merely a necropolis.

The first operation was the removal of the debris of the previous excavators which had been dumped close to their diggings. In so doing several baskets of decorated fragments were recovered, some of great interest. When cleaning these potsherds it was noted that all the colours save the outlines in black or sepia were fugitive, not only washing off, but actually rubbing off. These vessels could hardly have been intended for daily use since mere handling would soon rob them of their charm. It seemed therefore more probable they were funerary vases, so from the outset careful watch was kept for possible burials.

Two converging trenches A and E were dug on the outer limits of the deep excavation made by the Pioneers and later the intervening triangular area (Area A), some one hundred feet at the base, was completely cleared, Pl. VII. The principal structural remains disclosed by this clearance are the stone walls of thirteen rooms and courtyards. The word "room" is used for convenience for it is by no means certain they are rooms in the ordinary sense of that word. The walls are of three well-marked types. Walls of Type A are built of large, quarried stones from the neighbouring hills, and as these have a more or less parallel cleavage the walls present a smooth face of undressed stone. The irregularities of the large stones are corrected by filling the interstices with small stones or flattish water-worn pebbles but the technique in no way resembles that of the monuments of Gandhāra and no "diaper" results, Pl. X.

Walls of Type B are of large, roughly cubical or oblong boulders from river beds, the interstices being filled with small water-worn stones. Certain walls show a combination of these two styles and have been designated Type C. The walls are at right angles and roughly orientated to the cardinal points and in Area A are mostly of the A type. None are of any great height, most being of two courses only. The western wall of A-2 and A-3, however, has two courses on the eastern face, but four on the western as it acts as a retaining wall between two levels, Pl. X*a*. Some of the stones are large, one corner stone measuring 34″×10″. In one wall are traces of bonding. In all probability the stone walls were merely foundations, for on the top of several two courses of sun-dried bricks were recovered seemingly *in situ*. Since the tops of the stone walls are generally level, and as no stone debris was met with in clearance, it appears as if the walls were recovered to their original full height and any superstructures must have been of mud brick or some light material, which had entirely disappeared. No obvious entrances to the rooms can now be traced. Inside Rooms 5, 6, 8, 10, 11 is a projection in the centre of one wall and the side walls of Rooms 2, 3, 6, 8, 11 are curiously prolonged, Pl. VII. No traces of any roofing material or the charcoal of beams or rafters were discovered in this area. Most of the rooms had

earth floors but Rooms 4 and 9 had pavements of small water-worn boulders while Room 5 had a particularly solid flooring resembling walls of Type A and consisting of three courses of stones carefully laid over a foundation of gravel.

Whether these stone structures are the remains of deserted and ruined habitations or whether designed originally for funerary purposes cannot at present be asserted, but when excavated the whole area was found to be devoted entirely to the purposes of a necropolis and human remains and funerary pottery were found down to the floor level and in a stratum nowhere more than four feet in thickness. Several methods of inhumation appear to have been practised at the same time. In only three cases were the limits of individual burials marked in any way.[1] The other skeletal remains were found in small collections with a number of funerary vessels as detailed below. For convenience of reference and as best describing their appearance these have been designated Burial Groups. Of cremation no evidence whatever was recovered.

**BURIALS. I. Fractional Burials.** (1) Group I in A-1. On the 16th of May a group of seven vessels[2] more or less on floor level and roughly in one alignment east and west were discovered at the southern end of A-1. Between and behind these vessels fragments of seeming human bones were found but nothing resembling a complete skeleton, nor were the bones arranged in any way. Only one of the seven vessels, an open bowl, contained anything save earth, but in that a tooth, a vertebra and fragment of bone were found. These might have fallen into the bowl after burial.

The bones of this group together with certain other skeletal remains were sent to Lt.-Col. R. B. Seymour Sewell, I.M.S., Director, Zoological Survey of India and were examined by him and Dr. B. S. Guha, Anthropologist, Zoological Survey of India and their report on these is given below.[3] These scanty remains are from the bodies of at least four adults and two children.

(2) Group B in A-6.—In clearing the floor of A-6 a collection of thirty-two vessels was discovered (Pl. XII*b*). Part of a long bone was lying over one vase, many were scattered among the pots and two long bones were lying together. The whole group of bones and vessels lay in an area 9′ 9″ by 3′ 3″. No skull was found with these but eight days later when removing the earth at the north-west corner of A-6 the skull of an adult was found all alone. This may have been part of Group B but it was fully three feet distant from the nearest vessels. Even with this skull nothing like a complete skeleton was recovered, no pelvic bones, no shoulder blades, no vertebræ.[4] On examination it was found that eighteen of the thirty-two vessels contained earth

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[1](*a*) Infant's grave in A 7, (*b*), Infant's grave in A-13, (*c*) Complete burial of adult in A-7.

[2] For full description of this and other pottery, see p. 35 and Appendix IV.

[3] Appendix V.

[4] In clearing away the bank of earth on the west of Group B (Pl. XII (*b*)) some fragments of another skull were found but their origin is uncertain as they lay in the spoil earth of the previous excavators.

only. One was quite empty having been covered by another vessel. The remaining vessels all contained bones or bone fragments mixed with earth. Two phalanges were in one vessel, parts of two small ribs in a second, three metatarsal or metacarpal bones in a third and so on. It is not clear whether these bones were originally placed in the vessels or later found their way into them, but the latter seems the more likely in this particular case as bones were more frequently near the top of the pots. This may be considered as typical of a form of fractional or incomplete burial of which some twenty-six examples were discovered.

Lt.-Col. Sewell and Dr. Guha report that these human remains were of four persons, namely, two adults, a youth of about eighteen years, and an infant of about one year. Bones of a bird and a small mammal were also recovered with this group.[1]

**3. Burials in A 1.**—In order to ascertain whether burials were invariably incomplete four of the more skilful diggers were provided with knives and set to remove earth evenly over the whole area a few inches only at a time. Two feet three inches above floor level and in an area 28′×6′ 6″ no less than seven distinct groups of bones and vessels were disclosed. These are referred to below as C Burials. Here again it must be borne in mind that the distinction between these groups is necessarily arbitrary and the best that can be done is to record as groups those bones and vessels which appeared to be most closely connected when found. It may be, however, that Burial Groups C 3 and C 4, Pl. XI*a*, are one burial though separated, but C 4 and C 5, which are very close together would seem to be distinct seeing there are two skulls.

*Group C 1.*—Group C 1 consisted of a few thick bones, a fragment of a small skull, a few small bones and some broken vessels, one of which contained part of a scapula.

*Group C 2.*—Group C 2 was merely a few bones and several scattered vases, one ornamented with fishes and containing a bone fragment.

*Group C 3.*—Group C 3 had four vases and more bones than C 1 and also some long bones. One vessel, found inverted, covered a crumbled fragment of a human jaw bone. Pl. XI*a*.

*Group C 4.*—In Group C 4 were a skull without lower jaw, several pieces of long bone, a molar tooth of the lower jaw and one vessel. The skull was that of an adult. Quite close to this group were traces of sun-dried bricks but it is uncertain whether these originally passed over the burial or merely skirted it. Pl. XI*a*.

*Group C 5.*—Group C 5 as first revealed consisted of several broken bones and a crushed skull without lower jaw. Clearance close to C 5 disclosed another skull, face downwards, again without lower jaw, and later just under C5

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[1] For details see Appendix V., p. 83.

and below a piece of sun-dried brick a fragment of a skull and several vases were discovered. A foot to the north of C 5 and a few inches deeper in the soil were found two fragments of the bones of a skull pressed together.

*Group C 6.*—A number of small bones, several vases, two of them very small, and two fragments of a skull were all that was found of Group C 6.

*Group C 7.*—Group C 7 consisted of a few small bones only. Close to this was found the copper chisel, No. 69 of Pl. XIV*a*, and which was seemingly part of this burial.

Between C 6 and C 7 the ringstone No. 47 (Pl. XV*b*) was discovered and close to this under a potsherd was a very small piece of jaw bone with one molar. All crumbled when touched save the crown of the tooth.

Continued clearance in A 1 to a further depth of two feet, that is to three inches above the floor level, revealed under the seven C Burials traces of six others. As these were separated from the C burials by a stratum of sterile soil they appear to be earlier and independent interments of the same type. These have been designated as H Burials and are as follows:—

*Group H 1.*—Group H 1, consisted of many small bones, fragments of long bones, part of a pelvic bone and one vertebra. The level of these remains is that of Group 1, and they might possibly be outliers of that group. Later two pieces of skull and one vase were found in the earth close to the spot which yielded Group 1 and these are almost certainly part of that group.

*Group H 2.*—A fragment of a pelvic bone, the head of a humerus, one small bone and some potsherds formed Group H 2. This was probably the eastern portion of the burials of Group 1.

*Group H 3.*—In Group H 3 were two long bones, several small bones and ten bone fragments.

*Group H 4.*—Group H 4 consisted of small bones, the skull of a sheep-like animal and its jaw bone, two vessels, the remains of a large vessel of coarse ware containing three small vessels and a small rectangular cake of red ferruginous earth, No. 72. Just below these were found the very neat grinding stone and grinder No. 130(1), which might have been buried with an artist who used the colour.

*Group H 5.*—In Group H 5 were eight vessels and two long bones 1′ 5″ apart.

*Group H 6.*—Group H 6 was merely four long bones in pairs and 1′ 6″ apart.

**4. Group A.**—On the 23rd May in the bank behind A 2, ten feet below the surface and 6′ 2″ behind the east wall of A 2, and 1′ 4″ above floor level appeared five vessels and a skull (Plate XII*c*). Further clearance revealed a long bone lying on these vessels while traces of another skull and odd bones were found beneath. The vessels having been removed further clearance became possible and finally more vessels, five skulls, a lower jaw bone and the upper end of a long bone were revealed in an area 3′ 2″ by 1′ 6″. Later

and deeper digging into the bank revealed one more vessel, but no more human remains, so that it is plain in this case also complete skeletons were not buried. Moreover, from the position of the bones and skulls it seems certain that these were buried as bones and not as parts of a body clothed with flesh. The lower jaw bone was heavy with large very much worn molars. The little cavity which yielded this deposit is shown as A in the back ground of Plate X*a* just above the east wall of A 2.

**5. Group D.**—In the bank of earth 10′ 6″ south of Group A and behind A 3 level with the top of its eastern wall several funerary vessels were found. Search was made for skeletal remains but none were recovered. It is almost certain, however, that these vessels were part of a burial which had been disturbed by the previous explorers who had dug deep at this point.

**6. Group E in A 6.**—When removing the debris on the west side of Group B, (Pl. XII*b*), a collection of vessels was disclosed in the south-west corner of A 6 together with fragments of the jaw-bone of a sheep-like animal as well as other animal bones and teeth. A large, broken, open bowl contained earth and five smaller vases. *In the earth and between the small vases* were pieces of a rib, part of a pelvic bone and many small bones. *These appear to have been placed therein.* The bones found outside and around the large bowl and the other vessels were of animals. Lt.-Col. Sewell and Dr. Guha report that the human bones found in the large vessel are apparently of one individual, seemingly a female. It is obvious from the size of the vessel that it can never have held a complete skeleton. As this spot appeared to have been undisturbed by previous explorers probably all the remains originally interred were recovered.

Thus Room A 6, on one level, yielded the remains of at least five persons, four in Group B one in Group E.

**7. Group F in A 7.**—When clearing the northern end of A 7 close to the southern wall of A 6, bones and decorated vessels began to appear. Careful knife work finally revealed a skull and eleven vessels, six to the north of it and five to the south and at varying distances long bones , some other bone fragments and a dorsal vertebra, (Plate XI*b*). The face of the skull was to the west. Previous explorers had not disturbed the spot so that all the remains were recovered. Examination of the vessels revealed that nine contained earth only, one contained two bone fragments, while in another was a smaller vessel, a bone, potsherds and a white bead. These bones proved to be a human metatarsal bone, part of a rib of a small mammal (?) and a fragment of the scapula of a small mammal about the size of a gazelle. A broken pot held some phalanges which crumbled to pieces. It is plain, therefore, that the burial was incomplete for no pelvic bones, shoulder blades, lower jaw, ribs or the remainder of the vertebral column were traced.

With this deposit was the small stone chisel, No. 79, (Pl. XXI, 17), not a neolithic implement, but an imitation in stone of a metal prototype and

seemingly made specially for funerary purposes. A similar stone chisel No. 80, (Pl. XXI, 18) was found with another burial group in G 3. The skull in this group, being better preserved than the others, was given a coating of paraffin wax, wrapped in putties of cotton cloth and sent, with certain other remains to Lt.-Col. Sewell[1] who notes that it is markedly dolichocephalic with a prominent occiput. Pl. XXIV, Fig. 2 and compares it with the Sialkot skull.

**8. Group G in A 12.**—In excavating A 12 on June 1st at a depth of 12 feet below the ground but on what may be considered as the floor level an interesting collection of vessels was found together with the striking stone weight, No. 78 (Pl. XV*b*). Between these objects lay pieces of bone. This area was very damp and not only had bones rotted but the colours of some of the vases had disappeared and some of them had partially crumbled. An open bowl contained a bone fragment, while another held a bone and a piece of red ochre, but the rest were filled with earth only. Further clearance next day disclosed part of a femur and two more vessels and when on June 6th the high bank in A 12 was removed five more vessels, two bones, part of a pelvic bone and a rib were discovered, all possibly part of this same burial. No skull was found with this group.

**9. Other remains in A 12.**—On the extreme east of A 12 excavation exposed four long bones, fragments of other big bones, a rib and some phalanges. No vases were found with these remains, which might possibly have been part of Group G, though they were four feet to the east of the nearest vessels and bones of that deposit.

**10. Remains in Trench E.**—During the digging of Trench E on the extreme west of Area A human and other remains were found but not so grouped as to be distinguishable. On May 21st and during the following days numerous vessels were discovered. A large plain bowl of coarse fabric held two small vases each with a bone fragment on the top of the earthy contents and bones and fragments of a skull were found between and around other vessels. A shallow bowl found in A 13 held a small damaged squat pot and between the two was the curved fragment of a skull which could not possibly have found its way there by accident, Pl. XV*c*.

**11. Remains in A 3.**—While clearing the south-east corner of A 5 on May 20th three damaged vessels were found and in the broken remains of a very large bowl an unbroken smaller vase. With these no bones were recovered but later in the south-west corner some twelve feet away and two inches above the stone floor two more vessels were traced and behind these part of a long bone. The following day two more vases were unearthed and a few feet to the north the remains of a very large broken vessel close to which were some animal bones and a large rib of some animal such as a buffalo. It is not improbable that earlier excavators had removed part of the contents of room A 5.

[1] *Cf.* Report on the skeletal remains by Lt.-Col. Sewell and Dr. Guha, pp. 56—86 and Appendix V.

**12. Deposit under south wall of A 12.**—Immediately beneath the west end of the south wall of A 12 and at a depth of twelve feet below ground level a large broken pot, *dia.* 1′ 8″ was found containing another broken vessel, a large *chiragh* and a fragment of the jaw bone of a goat-like animal. About three feet east of this deposit part of a long bone 13¼″ in length and seemingly a fragment of a human femur was unearthed. It was lying over a funerary vase, and apparently unconnected with any other remains unless it were an outlier of Group G.

**13. Remains in A 7.**—South of Room A 8 and 2′ 10″ east of the infant's grave[1] a few fragments of ribs and some small bones were met with and five inches below these were one funerary vessel and a seeming animal bone. These could have no possible connection with the burials in the adjacent graves, (Pl. X*a* & *b*) and seemed likewise to be too far west of Group F to have formed part of that deposit.

**II. Complete Burials in Defined Graves.**—Besides these fractional burials other methods of inhumation were practised and three examples of complete burials in defined graves were met with in Area A.

**1. Infant's Grave in A 13.**—In digging Trench E some sun-dried bricks laid horizontally were met with in A 13 at a depth of 9′ 9″. After removing these a small chamber 1′ 11″×1′ 4″×11″ was disclosed made of sun-dried bricks set on edge. At this spot the ground was very damp but in the little box-like chamber, which was in reality a grave, were a few small bones, sixteen beads and a pear-shaped crystal pendant, E 12 (Pl. XV*a*). The remains are reported to be those of an infant and from the variety of bones would appear to be a complete burial (Appendix V, p. 82).

**2. Complete burial of adult in A 7.**—But certainty that complete burials had been in vogue was reached on June 5th. After Group F had been cleared on June 3rd and clearance of A 7 was proceeding two pieces of seeming walls of mud brick were left standing. It was noted that the faces of the more easterly wall were not parallel and the intervening material was soft and friable. Knife work finally exposed a barrel-shaped grave edged with mud bricks set on edge (Pl. XII*a*).

The grave was 5′ 1″ in length, the east end 2′ 0″, the west 1′ 8″ and the south side less curved than the north. The body lay on the left side, head to the east, face to the south with the left arm bent, the hand advanced, the right arm similarly bent with the hand to the face. The body was not straight and the angle made at the knees was about 50 degrees. The attitude was that of a person sleeping naturally on the left side with the knees bent but not violently contracted. There is no crouching as in the pre-dynastic burials in Egypt or in the Copper and Bronze Age burials in Central Europe, but it is interesting to note that the latest pre-dynastic Egyptian tombs have sometimes a lining of mud brick round the edge as here, and the bodies are

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[1] *Cf.* Complete burials in defined graves *infra. p.* 27, 3.

usually placed on the left side. Possessing no means of treating or removing these fragile remains they were again carefully covered with several feet of earth to await examination when the site is again excavated.

No vessels or other antiquities were found in this grave. This burial is possibly contemporary with the incomplete burials in A 7 and only three inches lower than Group F. In order to obtain the photograph shown in Pl. XII*a*, it was necessary to remove the brick edging on the south side. These mud bricks measured 21″×9″×3½″.

**3. Infant's Grave in A 7.**—The second fragment of seeming mud brick wall in A 7 lay to the north-west of the burial just described and proved to be a small grave resembling the one in A 13. It was 2′ 6″×1′ 11″ and made of mud bricks, 21″×9″×3½″ set on edge (Pl. XV*e*). Careful examination of the contents yielded only a mere handful of bones but these are seemingly the remains of the complete burial of an infant. The bones as discovered gave no indication of the position in which the body had been placed. As in the case of the other two grave burials no vases or other objects were found in this grave.

**III. Complete Burials without defined Graves.**—*1. Infant of about one year in A 13.*—But complete burials, at least of infants, do not seem to have been confined to formal graves for six feet to the north of the infant's grave in A 13 the remains of a damaged little skull and some bones were found without any traces of a grave. With these remains were no funerary vessels. Quite close to the base of the skull and still around the neck *and obviously part of a necklace worn when the body was buried* eighty-nine tiny white disc beads were obtained. Lt.-Col. Sewell reports the remains to be those of an infant of about one year. (Appendix V, p. 81.)

2. *Small skull in A 13.*—Some three feet to the south-east of the infant's grave in A 13 the remains of a very small damaged skull were found together with a vessel. No other certain bones were traceable but it is probable that these were the remains of the complete burial of a newly born child whose other bones had quite disappeared.

How much valuable evidence was removed and destroyed by former excavators cannot be stated, but it is certain they removed part of the burial stratum in many parts of Area A. Occasionally as in A 2-3, and in A 8-11 they had dug right down to floor level and completely through the burial stratum, but in no case do they seem to have destroyed walls. Our burials might therefore appear incomplete not because they were originally so but as a result of the removal of part of the bones in these earlier operations. While this might possibly be true in the case of Burial Group B, since these remains were in places only nine inches below the level of previous excavations, it is improbable in the case of Group F, and impossible in the case of the H burials since we ourselves found, these under the A burials. All the remains in Trench E were likewise entirely undisturbed, this trench lying out-

side the former diggings. From Groups A and E it is clear that in certain cases at least bones were buried and not bodies, and that antesepultural excarnation had been practised.

Incomplete burials are recorded by Mockler as occurring in *dambs* in Makran.[1] Of these he writes,

> "The bones of the deceased were probably collected after the body had been exposed to the elements and attacks of carnivora for a certain time and then placed occasionally in an earthen pot, but more generally loose on the floor of the damb."

Similarly at Moussian,[2] where four kinds of tombs of sun-dried bricks were found, fractional burials are also recorded and seemingly of an age when bronze was used for arms.

> "Souvent une partie des ossements fait défaut: ils sont dispersés sans ordre, au hasard, et les poteries du mobilier sont déposées parmi eux."

One thing is certain, that at Nāl several different forms of inhumation were in vogue at the same time and these cannot represent any evolutionary process.

There can be no question that the beautiful vessels found with the incomplete burials are funerary objects, but it remains to consider the other antiquities found in the necropolis.[3] Of the 267 beads only the little necklace and pendant E 12, (Pl. XV*a*), from the infant's grave in A 13 and the eighty-nine little white discoid beads found with the infant's skull in the same area can be definitely assigned to particular burials, the other beads being recovered here and there over the whole area and even in the earth disturbed by previous diggers. The curious stone weight 78, (Pl. XV*b*), from Group G, the grinding stone 130, found with Group H 4, the marble ringstone 47, (Pl. XV*b*), discovered lying between Burial Groups C 6 and C 7, the stone chisel (Pl. XXI, 17) from Group F and the fragment of an earthenware vessel worked to simulate a copper tool (Pl. XXI, 16) from A 13, are all seemingly funerary furniture.

But the most important objects found in the necropolis are the copper implements (Pl. XIV*a* & *b*). The copper tool (Pl. XIV*a*) 69, was found in A 1 near Group C 7, but Nos. 6, 49, 50, 52, 57 were found in A 3. It should be noted that in A 3 we discovered no skeletal remains. The two implements Nos. 6 and 57 (Pl. XIV*a*) were found alone, but Nos. 49, 50, 52 (Pl. XIV*a*) and No. 51 (Pl. XIV*b*) were found together, one touching and the other close to two funerary vessels. Apparently these vessels and tools were a portion of a burial group which the previous explorers had missed when removing the burial stratum in A 3.

No. 18 (Pl. XIV*b*), Nos. 19, 43, 44 (Pl. XIV*a*), Nos. 53, 54 (Pl. XIV*b*), were all found on the stone floor of A 5, but not in immediate conjunction

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[1] Mockler. *J. R. A. S., Vol. 9, pp. 121-134, 1877.*

[2] *Mem. du delegation en Perse. T. VIII, p. 76.*

[3] *Cf.* Appendices I—IV.

with either skeletal remains or other antiquities though as traces of a funerary deposit were found later on the southern end of A 5 it is not unlikely that these copper tools are likewise the remains of a burial of which the skeletal remains had disappeared before our arrival.

The presence of a piece of a red ochre in one of the funerary vessels of Group G and of the carefully moulded little cake of red ferruginous earth, No. 72, in a large broken vessel in Burial H 4 can hardly be fortuitous, but nothing can be definitely asserted concerning the yellow ochre found in A 12 and the cerrusite and galena lying on the floor of A 3.

In an endeavour to ascertain the lowest level of burials and occupation part of the stone flooring of room A 5 was removed and a pit dug to a depth of 5′ 4″, but only sterile sandy alluvium was found. To reach a still deeper level a trench was dug north of A in the low land between Areas A and D but up to a depth of 5′ 6″ nothing but virgin soil was met with, so that the floor level of Area A appears to mark the earliest culture stratum on this part of the site.

### Area B.

In order to examine as much as possible of the mound in the limited time at our disposal trial excavations were carried out at several other points and yielded information and antiquities of varying importance.

Twenty-eight feet north of Area A a piece of stone wall of Type A seven feet in length, was noticed on our arrival, (Pl. VI B). Clearance showed that this consisted of only two courses of stone surmounted by sun-dried bricks. These fine and well moulded bricks were $23'' \times 9'' \times 3\frac{3}{4}''$ and of these two courses still existed. Behind this wall, level with its top and parallel to it was a second wall of Type C. In a trial pit behind this latter was recovered a neolithic quartzite celt, (Pl. XV*b*), 40. Drainage from the top of the mound had cut a small channel at the west end of these two walls and disclosed the fragment of wall or foundation made of mud bricks $12'' \times 12'' \times 7\frac{1}{2}''$ of which mention has already been made.

### Area C.

Traces of walls of the B and C Types were numerous on the east side of the mound close to the fields and almost on the same level, near the point C on Plate VI. Several of these were cleared but, as elsewhere, none was more than two courses in height. They had, apparently, been foundations. Of the superstructures nothing now exists. No antiquities were found in this area. To ascertain, if possible, the limits of former occupation at this spot a trench nine feet deep was carried thirty feet north-eastwards into the field. Up to a depth of five feet only occasional potsherds and some large stones were met with. Below this only seeming virgin and sterile soil was found so that it is unlikely the ancient settlement, at this point, extended beyond the present limits of the mound.

## Area D.

Reference has already been made to the very red appearance of the summit of the mound and which appeared to be due to some conflagration. Over this ground which has been designated Area D a trench was carried northward, Pl. VI. At the southern end only debris of burnt mud brick and potsherds of coarse ware were met with but towards the northern end, the material was black and powdery. Knife work here revealed two more or less parallel walls of plastered mud work, 15′ in length and joined at the northern end by a similar cross wall 7′ 6″ in length. The southern ends were not traceable, Pl. VIII. The upper edges of the walls had decayed, but 2′ 6″ below ground level were found the charred ends of little round rafters. At the northern end of the east wall these were about 1′ 3″ between centres and from 2″ to 3″ in diameter, but towards the south they were closer together and smaller. The ends of these rafters are plainly visible in Plate XIII*a*. In the western wall there are corresponding rafters but more irregularly spaced. The charcoal of these rafters, which seem to have been undressed branches of trees, was found in great quantities during the clearance.

At a depth of five feet cross walls running north and south, and east and west form four deeper and smaller compartments (Pl. VIII, Plan), and these were likewise crossed by numerous little rafters whose charred ends are some 6′ 3″ below the upper ones (Pl. VIII, Section). In both No. 3 and No. 4 immediately below the remains of the lowest rafters a large broken vessel of coarse ware was found. That in No. 3 [1] contained ash and four pieces of bone which Lt.-Col. Sewell identifies as two phalanges and the fragment of a rib of a small mammal of the size of a gazelle and the fragment of the rib of a mammal such as an ox. The vessel in No. 4 contained a little earth only.

On the wall between No. 2 and No. 4 were found the four fragments of a copper implement (Pl. XIV*b*), 55.

Broken figurines of bulls, burnt animal bones, fragments of coarse undecorated pottery, and a grooved disc of bone were the only other antiquities recovered in these four little chambers.

Another small irregular chamber, No. 5, was traced north of No. 2, but nothing was found therein. The walls of these five chambers are of plastered mud brick, but they are no longer very straight and the courses of brick not easily recognizable. Immediately over the upper rafters of No. 3 and the lower rafters of No. 4 some mud bricks are very clearly defined, but it is unlikely the rafters carried a pavement of brick as no brick debris was recovered in clearing Nos. 3 and 4 at this level.

The purpose of these irregular chambers cannot at present be conjectured. Even for store rooms they would be inconveniently small. The walls are

[1] This vessel was 18″ in diameter and two inches below the brim had two raised parallel bands three quarters of an inch apart and below this a raised sinuous band. This coarse ware is quite unlike that from the necropolis.

much blackened. This may be due to the smoke from the burning of the two roofs of rafters but the blackening seems rather that of walls constantly exposed to smoke than the result of one conflagration.

To the east of No. 5, and 3′ 3″ distant, the mud brick walls of another chamber, No. 6, was traced (Pl. VIII). These are not rectangular and they have bulged in places. The west side is some twelve feet in length, the south eleven feet and the north nearly nine feet. The east wall did not seem to be continuous but it proved impossible to trace with certainty the side walls at the points where the brick facing was missing, (Pl. VIII, Plan). A stout charred beam 9″ in diameter was found embedded in, and projecting from the west wall some seven feet below ground level and seemed to have supported nine rounded rafters, *c* 5½″ in diameter, which were fixed in the north wall (Pl. XIII *b*).[1] The northern ends of the cross rafters are higher than the beam and, as no signs of rafters are visible in the south wall, it appears as if the beam had supported a sloping roof. After removing the charcoal of the beam and rafters the room was dug to a total depth of fifteen feet. At the base of the east wall was an irregular charred beam resembling a rough wall plate and carrying vertically a post some four feet in length (Pl. VIII, Section). No less than three lines of the ends of charred beams are traceable in the east wall (Pl. VIII, Section) but the time at our disposal rendered it impossible to explore this room further. In this room D 6 were found the three drinking cups Nos. 61-63 (Pl. XIX, 2) some broken figurines of bulls (Pl. XXI, 10, 12), spherical pounding stones and a piece of leaden slag. To the south of D 6 the rectangular corner of another room No. 7 was traced but no clearance was carried out here.

In the superficial debris north of D 6 several objects were discovered namely No. 38, a fragment of a copper chisel, two pieces of cerrusite, a fragment of an ore consisting of cuprite and cerrusite,[2] and the broken base of a small marble vessel, No. 88.

The copper knife found in Area D would seem to assign these structures to a race possessing a culture similar to those whose remains are found in the necropolis (Area A), but when Area D was in occupation Area A on the outskirt of the settlement appears from the strata revealed by our excavations to have been used as a deposit for ashes and rubbish. The three earthen vessels found in Area D (Pl. XIX, 2) bear no resemblance in form, fabric or decoration to the funerary vessels. Nevertheless as these cups are seemingly utility vessels, designed to meet every day needs they might possibly be contemporary ware even though found at a height of forty feet above the necropolis.

**Trench E.**—Mention has been made above of Trench E. This was fifty-six feet long and driven into the mound on the south-west side of Area A

[1] As this photograph had to be taken from the top of the south wall there is considerable distortion but the main beam and cross rafters are plain. The beam was actually level with the lower ends of the rafters.

[2] *Cf.* 39 Appendix III.

in order to reach strata undisturbed by earlier explorers. Later this trench merged into Area A. Pl. VI. In this trench were found the infant's grave in A 13, two infant burials in unmarked ground, Group G, the deposit under the south wall of A 12 and the other remains described above, as well as eighty-six funerary vessels and one hundred and twenty-one beads and other antiquities and objects described in detail below.[1] The burial stratum here yielded no evidence of burial over burial as in A 1.

**Area F.**—A light shower of rain revealed on the barer slope of the mound between Areas A and D the outline of some walls, (Pl. VI F.). Excavation disclosed the rectangular corners of a chamber with walls of mud brick. A single workman was employed for several days to dig by these walls with a knife only. He recovered the copper seal No. 56 (Pl . XV*d*), a fragment of a copper chisel No. 60 (Pl. XIV*b*), six beads all of different form and of five different materials, as well as two vessels RF 1, RF 2 (Pl. XIX, 13, 14) quite unlike those found in the necropolis. Scarcity of labour unfortunately prevented complete clearance of even one of these chambers though from the antiquities obtained therein, they appear to have been habitations. But this cannot be definitely asserted without complete excavation for these mud brick walls might stand on stone foundations like those in Area A and the possibility that burials might have been found at floor level must also be considered.

**Area G.**—Attention has been drawn in the description of the site to a portion on the north-west which as a result of digging by the villagers and the later action of water had been cut off from the main mound. This, which is marked G in Pl. VI, lies some sixty feet north of Area A. Traces of a stone wall in the high bank at G seemed to offer the possibility of an area devoted to purposes other than those of burial, and it was hoped to discover here habitations and domestic objects. In the preliminary clearing two small vessels and one larger shallow vessel were discovered. Later three small rooms were disclosed. The walls were of C type and again only two courses in height, and like those in Area A were orientated to the cardinal points, Pl. VI. In the west wall of G 3 is a projection similar to those in A 5-6, and A 10-11. Rooms G 1 and G 2 were paved with small water-worn boulders. In clearing these three rooms one hundred and thirty-seven beads of agate, carnelian, lapis-lazuli and paste were recovered, while under the pavement of G 2 were found a very neatly cut grinding stone No. 81 (Pl. XV*b*) and its little grinder, as well as eleven very pretty, graduated, pale, agate beads. In G 2 were also recovered two fragments of worked bone No. 70 and a fragment of copper chisel No. 71 (Pl. XIV*b*). A white steatite press seal No. 73 (Pl. XV*f*), showing a vulture with one foot on a snake was found in G 1. These objects are such as might reasonably be expected to be found in houses but it is very probable those above the floor level were, after all, from burials as the clearance of G 3 exposed twenty-six vessels of the types

[1] Appendices I—IV.

found with the incomplete burials in Area A (Pl. XII*d*). The skeletal remains were in this case remarkably scanty being merely a few bones under six of the vessels and the decayed ends of three large bones found in a broken vessel of Type 4. Many of the vessels were beautifully ornamented with fishes, (Pl. XX*b*). In the earth just above these vessels was a stone chisel, No. 80 (Pl. XXI, 18) obviously imitating a copper tool and seemingly made for funerary purposes. This still bore the fine striations of the tool, or material, used to polish it.

The only metals recovered at the site were copper and silver, of which the former was used for tools and weapons (Pl. XIV), beads and the copper seal, (Pl. XV*d*), and the latter for a little finger ring and an unidentified object, No. 20. Of gold there were no traces whatever. From the presence of galena and cerussite and leaden slag a knowledge of lead and its smelting may be presumed, but no objects of that metal were found. Marble was used for the ringstone (Pl. XV, 47) and a little stone vessel No. 88, steatite for the seal figured in (Pl. XV*f*), and semi-precious stones, agate, carnelian and lapis-lazuli for the beads in (Pl. XV*a*), quartzite for grinding stones and grinders and the celt in (Pl. XV*b*) 40, limestone for the large weight (Pl. XV*b*), 78, for the celt No. 86 and for rubbers and pounding stones. For certain rubbing stones, pestles and pounding stones a fine sandstone was also used. Flakes and cores of flint and chert were entirely absent. The only evidence of the use of wood was the charred beams of Area D.

Shell was not abundant and only one small shell bangle No. 58 was found in the later debris above Trench E but a few shell beads were obtained in Areas A and D. No conch shells and no unworked sections of these were discovered. A few paste beads with green glaze were found in Area A (Pl. XV*a*, 6).

Terra-cotta figurines of animals were numerous in Areas A and D. Save one of a ram, (Pl. XXI, 9) all were of the Indian humped bull, and none were complete. What the little animal on Pl. XIX, 5 is supposed to represent, it is impossible to state with certainty, but it may be a squatting dog. Unless the quaint little figure in Pl. XXI, 19, be meant for a man, human figures are entirely unrepresented.

Among the most interesting smaller antiquities recovered in Areas A, E, F, G were some four hundred and twenty beads. These are principally carnelian, agate, lapis-lazuli, shell, paste and various coloured limestones. A much corroded copper fragment in which a thread was still preserved appeared to be the remains of a copper bead, but no other example of metal beads was found.

The commonest form is a bi-conical bead with blunt ends (Pl. XV, 1, 3, 4, 5), of which the largest specimen is 60 mm. in length (Pl. XV, 4). Beads of this shape are found at Mohenjodaro and in graves of the early

Iron Age in Southern India.[1] At Nāl this form undergoes many modifications becoming in some cases bi-hexagonal and in others, where the sharp central ridge is lost, barrel-shaped.

But the most striking bead form and one not hitherto recorded in India is the flattish irregular hexagon of which a fine specimen is seen in Pl. XV*a*, 7. This is a pale yellow agate the major axis 36 mm. the minor axis 23 mm. Strange as it may seem this form of bead is actually another modification of the bi-conical bead. The latter is cut from a square prism, while the irregular hexagon is the same form cut from a rectangular prism of small cross section. These hexagonal beads are made slightly thicker along the major axis to avoid undue weakness after boring.

This form of bead appears to have met popular taste for it is found not only in agate but also in paste and lapis-lazuli. In the latter substance it is invariably built up of two pieces, each piece being half of a complete bead cut along the minor axis. The difficulty of procuring large pieces of lapis-lazuli would account for this. This hexagonal bead also shows many variations tending to become contracted in length and more lozenge shaped.

The longer beads have been bored from both ends and in most cases the point of junction is well marked. The holes are exceptionally large being in some cases 5 mm. in diameter pointing to the use of some coarse drill. As a result of this the ends of small beads are thin and are frequently found broken.

Cylindrical beads in lapis-lazuli and paste are very common, as well as disc beads made by cutting off thin sections from similar cylinders. A few specimens of thin tubular beads were also found, as well as two of irregular shape.

All these beads might have been imported but as unpolished, unpierced, and roughly modelled specimens were also found it is very probable they were worked on the spot, though the stones were brought from afar.

Several paste beads still preserved traces of a green glaze (Pl. XV*a*, 6). Shell beads were usually barrel-shaped or flat discs, but one broken shell bead was a thin oblong, pierced by holes close, and parallel, to the two short sides, as though part of a double-strung necklace.

The only beads found directly in conjunction with burials were those in the Infant's Grave in A 13 (Pl. XV*a*), E 12 and the eighty-nine little disc beads found with the infant's skull in the same area. Eleven of the small agate beads were found under the stone floor of room G 2, but it is very probable that the majority of the beads were from funerary deposits. Only one piece of rock crystal was recovered, namely the pear-shaped pendant of necklace E 12 (Pl. XV*a*).

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1. Bruce Foote. *Catalogue of the Pre-historic Antiquities. Madras Government Museum. Pl. XIII, 828, 829.*

Reference has already been made to Sir John Marshall's concise and scholarly note on the 59 vessels recovered at the Sohr Damb by Mirza Sher Muhammad in 1903.[1] It is now plain that these must have come from the necropolis for not only do they resemble those discovered by us in Areas A and G but on the top of the earthy contents of vessel 9, Pl. XXXIV, fragments of bone are still visible proving it came from an incomplete burial. Two hundred and seventy-one specimens of pottery were recovered in our operations and these fall into thirty well marked types, Pl. XVI. All save five [2] came from the necropolis and were used as funerary vessels though some may originally have met other needs. It is interesting to note that of the 25 specimens illustrated in Plates XXXIII-XXXIV of Sir John Marshall's article there are two types which are entirely unrepresented in our large collection.

All the wares are wheel-made and while there is a general resemblance there are marked differences between the fabric and ornamentation of the various types. The clay is usually fine and well mixed, but less so in the case of the large vessels such as Pl. XVI, 28, Pl. XIX, 17.

The wares exhibit great variety in colour ranging from greenish grey, through buff to a fine red, while some of the vessels of Type 1 (*b*) are almost black. The variations are due, in part, to different firing.

Some bowls of Type 1 (*b*) give a full ringing sound, but whether this is due to an excess of silicates in the clay or to firing in a high temperature has yet to be determined. All the vessels are porous and some, such as the bowls of Type I (*b*), noticeably so. Certain of the undecorated pieces such as Pl. XVI, 4, 16, Pl. XVIII, 7, Pl. XIX, 5, contain free lime which gives them a speckled appearance. In general the vessels are well shaped but occasional distortions occur in vessels of Types 5, 6, 7 and some show on the underside marks of cutting and of beating by some tool before firing.

Although exhibiting great variety in form it will be noted that most of the pieces are open vessels without spouts or handles save in the case of twin pots of Type 12, Pl. XVI 12, Pl. XIX, 1. One vessel of Type 11 has on one side what appears to be the remains of a lug pierced horizontally. Type 5 is hardly a true pottery form, such canister-like vessels being more suited to wood or metal and proof of this is afforded by the frequent sinking of the top or curving in of the sides, Pl. XVI, 5, Pl. XX *c*. Jars of this form would appear to require lids such as type 16, Pl. XIX, 5, but none were found with or near them. It is significant that not more than one specimen of these curious vessels was ever found in each burial group. The twin vessels of Type 12 may have been for colours, but no traces of colouring remained, though red and yellow ochre were found in the necropolis. The small squat

[1] Marshall. *A new type of pottery from Baluchistan A. S. I., 1904-05, pp. 105-06, Pls. XXXIII, XXXIV.*

[2] *Pl. XVI, 13, 24, 25 ; Pl. XIX, 2, 13, 14.*

pots of Type 10, Pl. XVIII, 16, 17, are reminiscent of those found at Susa.[1] Vessels of Type 13, Pl. XIX, 2, came from Area D only, and in shape are not unlike cups from Susa.[2] Their greyish red fabric and ornamentation are in marked contrast with wares from the necropolis. The little four pointed vessels Type 14, Pl. XIX, 3, appear to be lamps but none bear evidence of use. The vessels of Types 24 and 25, Pl. XIX, 13, 14, unique specimens from Room F, differ in shape, fabric and ornament from those from the burial stratum. Large vessels of coarser ware such as No. 17, Pl. XIX, usually contained several smaller vases and sometimes bones which appeared to have been very carefully placed therein.[3] Ring bases are a noticeable feature of the majority of the vases. The walls of many of the vessels are very thin and some of Type I (*b*) are not more than 1½ mm. in thickness and the open bowl No. 9, Pl. XIX, is of exceeding lightness.

Vessels of Type 4, Pl. XVIII, 7, Type 12, Pl. XIX, 1, Type 17, Pl. XIX, 6, Type 25, Pl. XIX, 14, Type 28, Pl. XIX, 17, are plain and without any slip. Those of Type I(*a*), Pl. XVIII, 1, and Type 19, Pl. XIX, 8, have a dark slip, while all the rest are ornamented with designs in sepia and black over a slip, white in certain cases, black or red in case of Type 1, Pl. XVIII, 1-4, and Type 2, Pl. XVIII, 5, and greenish-grey, buff, or pale yellowish brown in the case of the polychrome vases of Type 3, Pl. XVIII, 6, Type 7, Pl. XVIII, 14, Pl. XX*a* & *b*, Type 8, Pl. XVIII, 15. In the case vessels of Type 2, Pl. XVIII, 5, Type 3, Pl. XVIII, 6, Type 5, Pl. XVIII, 8, Pl. XX*c*, Type 7, Pl. XVIII, 14, Pl. XX*a* & *b*, Type, 8, Pl. XVIII, 15, Type 21, Pl. XIX, 10, these designs are filled in with yellow, blue, green or black, but no single vessel has more than three colours in addition to the sepia outline. Blue and green are less frequently preserved than the red, yellow and black.

As already noted above the colours of these polychrome vases are not permanent and have been applied after the vessels have been fired,[4] and several vases were recovered with elaborate designs still awaiting their filling of colour. Only one broken vessel of Type 3 had the shallow bosses in the centre of the circles like that published in Pl. XXXIII, 8 of Sir John Marshall's[5] note but judging from potsherds recovered in clearance this form of decoration must have been largely used.

Representations of the principal designs, one third full size, appear in Plate XVII and a few additional patterns are seen on potsherds Nos. 1-8, 13-15 on Pl. XXI. Their variety is considerable, ranging from the simplest geometrical patterns to the elaboration of Nos. 34-36, Pl. XVII, Pl. XX*a*, *c*, *d*. These designs are for the most part disposed in horizontal bands or trapezoidal panels around the visible portions of the exterior of the vases,

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1 *Mem. du delegation en Perse, Vol. XIII, Pl. XIX, 3, 8, 9.*

2 *Ibid, Figs. 5, 7.*

3 *Cf.* Group E in A 6.

4 The sepia outlines of the designs are permanent.

5 *A. S. I., 1904-5.*

but designs 41-45 in white are used for the interior decoration of open bowls of Type 1 (*a*)-(*d*), Pl. XVIII, 3-4. The spacing is generally well thought out and there is rarely overcrowding. The curious O-mega figure, Pl. XVII, 13 occurs singly, in bands, Pl. XVIII, 14 and in conjunction with other designs such as No. 36, Pl. XVII, Pl. XX*a*. The pattern No. 34, Pl. XX*c* is of special interest while No. 35, Pl. XVII, Pl. XX*d* based on intersecting circles has also been found at the two Indus Valley sites, Mohenjodaro and Harappa. The step patterns No. 26-30, Pl. XVIII, 8, 16 are reminiscent of those in Susa 1 pottery [1] and there is also resemblance between Nos. 7, 51, 55, 4 of Pl. XVII and Figs. 147, 149, 165 and 166 of designs on Moussian pottery.[2]

Of natural forms we have only leaves Pl. XVII, 24-25, Pl. XVIII, 15, Pl. XXI, 1-4 and animals. These latter include the humped bull,[3] Pl. XVII, 59, the cow, (?) Pl. XVII, 61, Pl. XXI, 14, the Sind ibex, Pl. XVII, 46, 63, Pl. XVIII, 10, the Persian gazelle, Pl. XVIII, 9, fishes, Pl. XVII, 62, Pl. XIX, 4, Pl. XX*b*, the winged lion (?) Pl. XXI, 8 and the scorpion Pl. XVII, 58.[4] Birds seen in profile appear on potsherds, Pl. XXI, 5, 6. The identification of the creature illustrated on Pl. XXI, 7, Pl. XVII, 60 is uncertain though it is most probably intended for a long legged bird such as the Lesser Bustard or Demoiselle Crane, represented with one wing point raised and the other drooping. The very curious ornament Pl. XVII, 57, Pl. XVIII, 12 is of particular interest and may be a highly conventionalized representation of a deer with horns having four tines. It is tempting to consider the head of the ibex Pl. XVII, 46, Pl. XVIII, 10 as appearing on a mountain slope but there is nothing elsewhere to suggest representations of scenic backgrounds.

The style is not a young one and may be defined as naturalistic tending to conventionalization. The varied treatment of the fishes of Pl. XX*b* [5] and on Pl. XIX, 4 and Pl. XVII, 62 shows steps in that direction while Nos. 57 and 60, Pl. XVII mark further degeneration.

As the transport of pottery in Baluchistan is not and can never have been easy, owing to the mountains and lack of convenient means of conveyance, these wares are probably local products. No pottery is now made at Nāl and no traces of the clay which might have yielded the material of these pots were obtained. A semi-nomadic people, as were probably the early inhabitants of the Sohr Damb, are unlikely to carry about vessels of fine fabric in their periodic wanderings so that while vessels of Types 1, 9, 12 13, 14, 19, 24, 25, 28, 30 might have been domestic utensils it is more probable that

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[1] *Mem. du Delg en Perse. T. XIII, Figs. 5-7.*

[2] *Mem. du Delg en Perse. T. VIII, pp. 98, 99, 105.*

[3] The trefoil and triangle above the bull recalls the pediments of Kashmir temples.

[4] The humped bull and ram occur in figurines and the squatting animal on the terracotta lid. Pl. XVI, 16 Pl. XIX, 5 is seemingly a dog.

[5] According to the *Jhalawan Gazetteer. p. 226* the commonest fish in a sacred pool near the shrine of Pir Chhattar in the Mula Pass have black stripes and reddish fins and tails. The fishes on the polychrome vase Pl. XX*b* have red fins and tails and the stripes are plain on Pl. XIX, 4.

all save Type 13, Pl. XIX, 2, Type 17, Pl. XIX, 6, Type 24, Pl. XIX, 13, Type 25, Pl. XIX, 14 were funerary vessels.

It is obvious that this pottery is in no sense primitive and its closest affinities are with wares from Susa and Moussian.

The hope that these excavations might yield evidence of connections between the early civilizations of Mesopotamia and the Indus valley has not been realized, and the links with Mohenjodaro and Harappa are few. The design of interlaced circles found on the funerary vase Gp. 2 (Pl. XX*d*) is, indeed, common to all three sites, and a stone weight resembling No. 78 (Pl. XV*b*) has also been found at Mohenjodaro. But the entire absence at Nāl of the pictographic seals and chert flakes and cores so abundant at Harappa and Mohenjodaro and the marked differences in fabric, form and ornament between the pottery of Nāl and that from the Indus sites would seem at first sight to indicate cultures separated considerably in point of time. It should not, however, be forgotten that the Nāl excavations have dealt principally with the necropolis of a small settlement whereas it is city sites which have been so far explored at Harappa and Mohenjodaro. There is, of course, no certainty that the Nāl and Indus Valley cultures were synchronous. All that can be definitely asserted at present is that copper implements, painted pottery and a somewhat complex pottery design and a striking form of weight are common to both. But it is not without interest to consider whether the differences might be accounted for had these civilizations been contemporary.

It must be borne in mind that Baluchistan is to-day largely desert. Whether within the last four thousand years it was ever blessed with a much greater rainfall is doubtful. In any case the inhospitable nature of Makran in the Fourth Century B. C. is at least vouched for. Possibly when the Nāl culture flourished the greater part of its inhabitants, like those of to-day, were nomadic and lived for half the year outside its highlands. This could not fail to bring them into contact with the more highly developed Indus civilization, but the contention that this would greatly modify their standard of living and culture cannot be maintained, for though nowadays great numbers of the people of Jhalawan winter in Sind and work at Karachi and other large centres their mode of life is little affected. Their houses lack entirely the conveniences of even rural India and their possessions are limited both by their poverty and nomadic habits, and they can neither read nor write. Even though caravan routes crossed Baluchistan the bales, save when looted, might travel unopened from one end of the country to the other and their contents remain unknown to its inhabitants and, possibly, be beyond their means. In all probability, the contrast, between the antiquities recovered from the little settlement at the Sohr *Damb* and those from Mohenjodaro, is not greater than between the poor household gods of the present inhabitants of the hamlet

of Gumbadi and those of the citizens of present day Karachi and Hyderabad, the differences being due not to separation in time but in space.[1]

The civilization revealed by these excavations is of a more advanced type than that of the present inhabitants who are only now emerging from barbarism and have no notion of the use of stone for building purposes or the making of even the simplest pottery. The conclusion can hardly be avoided that when this Nāl culture flourished physical conditions were more favourable than to-day, not necessarily because the rainfall was markedly heavier than now, but because the then inhabitants by concerted action more carefully conserved and controlled the water supply and, in so doing, assisted in the formation of alluvial soil over the dry and rocky substratum thus preventing the erosion which to-day tends to leave only a barren and gravelly surface and it is, in all probability, to this stone using race that should be attributed the ancient *gabrbands*[2] so numerous in Jhalawan and other parts of Baluchistan.

Be that as it may, the Nāl operations have demonstrated the former existence in Baluchistan and in the vicinity of the Sohr Damb of a dolichocephalic people who used both stone and mud brick for building purposes, whose tools and weapons were of copper and who carefully buried their dead in different ways; a people acquainted with the art of smelting ores and highly skilled in working refractory stones, capable at least of spinning if not weaving, who had domesticated the cow, sheep and possibly the ram, fowl and dog and to whose artistry and craftmanship the decoration, fabric and form of their beautiful funerary pottery bear convincing witness. Of their race, appearance, dress, religion, language and script no evidence is yet forthcoming.

It is improbable that this culture was isolated in the Nāl valley and, indeed, antiquities in the Quetta Museum and information obtained while in Baluchistan appear to indicate it was widespread. Excavations at Nichara[3] and Mamatava in Jhalawan, at Laghor Zard some three miles N. N. E. of the Sohr Damb, at Ahmad Khan Zai near the Fruit Farm, Quetta, and Mian Gundi Mound eleven miles from Quetta on the road to Mastung or at the mounds reported to exist near Pir Chhattar[4] in the Mula Pass might throw valuable light upon this interesting, artistic and hitherto unknown people.

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[1] Nāl lies, as the crow flies, 120 miles west by north of Mohenjodaro. The route by way of the Mula Pass almost doubles this and certain labourers from Nāl who came to work on excavations at Mohenjodaro the following winter took a month on the journey.

[2] Hughes Buller, *Gabrbands in Baluchistan. A. S. I., 1903-4, p. 104.*

[3] An open bowl from Nichara and which is now in the McMahon Museum, Quetta, is reported by the finder to have contained a skull, seemingly part of an incomplete burial.

[4] *Cf. Jhalawan Gazetteer, p. 226, Kachhi Gazetteer, p. 195.*

## APPENDIX I.

### *List of Nāl Antiquities other than Beads and Pottery.*[1]

(*a*) METALS.

6 Copper adze, *l.* 131 mm. *th.* 11 mm. Straight cutting edge, ground both faces. Pl. XIV(*a*) . . . . . . . . . . . . . . A 3

18 Copper saw, *l.* 370 mm. Tapers from 60 to 40 mm. Three holes at the broader end seem to indicate a former wooden handle. Only 30 mm. of serrated edge preserved and this has twelve teeth. Found with No. 19. Pl. XIV(*b*) . . A 5

19 Copper adze, *l.* 210 mm. *th.* 3 mm. Curved splayed cutting edge ground on one side only. Found with No. 18. Pl. XIV(*a*) . . . . . . . . . A 5

20 Silver foil. Eight fragments of brittle and oxidized silver foil. Largest fragment 201 mm. in length. One fragment shows small parallel flutings in repousé . . A 5

38 Fragment from end of copper adze like No. 6. Used for analytical purposes . D surface.

43 Copper adze, *l.* 163 mm. *th.* ? mm. Curved and slightly splayed cutting edge ground on both sides. Found with No. 44. Pl. XIV(*a*) . . . . . . A 5

44 Copper Chisel, *l.* 233 mm. *th.* 5 mm. Slightly curved and splayed cutting edge ; ground on one face only. Resembles a modern mortising chisel. Pl. XIV(*a*) . A 5

49 Copper tool, *l.* 122 *th.* 3 mm. Oblique cutting edge ground on both sides. In two pieces. Found with Nos. 50-52. Pl. XIV(*a*) . . . . . . . . . A 3

50 Copper tool, *l.* 118 mm. *th.* 5 mm. Slightly curved cutting edge, ground both faces. Edges raised. Appears to have had a hole at the top, now broken. Pl. XIV(*a*) . A 3

51 Copper saw, *l.* 126 mm. Straight cutting edge but curved back. Four pieces rejoined. In 20 mm. are 9 teeth. Pl. XIV(*b*) . . . . . . . . . A 3

52 Copper chisel, *l.* 123 mm. rectangular section. Straight cutting edge ground on both faces. Pl. XIV(*a*) . . . . . . . . . . . . . A 3

53 Copper fragment, *l.* 177 mm. Found with Nos. 18-20. Pl. XIV(*b*) . . . . A 5

54 Copper dagger or spear head, *l.* 126 mm. Upper part with tang preserved. Found with Nos. 18-20. Pl. XIV(*b*). . . . . . . . . . . . . A 5

55 Copper knife or dagger, *l.* 155 mm. Four pieces rejoined. Sharply tapering blade with tang. Pl. XIV(*b*) . . . . . . . . . . . . . D

56 Copper seal, *dia.* 29 mm. Roughly circular with six projections and circular centre. Lug with hole on reverse. Pl. XV(*d*) . . . . . . . . F

57 Fragment of copper tool, *l.* 68 mm. Tapering. Pl. XIV(*a*). . . . . . A 3

60 Fragment of copper tool, *l.* 33 mm. Circular shaft with straight cutting edge 9 mm. Ground both faces. Pl. XIV(*b*) . . . . . . . . . F

69 Copper tool, *l.* 120 mm. *th.* 3 mm. Straight cutting edge ground on one face only. Pl. XIV(*a*) . . . . . . . . . . . . . . A 1

71 Fragment of copper tool, *l.* 10 mm. Curved splayed cutting edge ground on both faces. Pl. XIV(*b*) . . . . . . . . . . . . . . G 2

76 Modern steel knife left by some of the previous excavators and found in their spoil earth 1' 9" above the level of Group B . . . . . . . . . . A 6

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[1] For detailed list of beads see Appendix II, for Pottery Appendix IV.

*List of Nāl Antiquities other than Beads and Pottery*—contd.

(*b*) STONE.

| | | |
|---|---|---|
| 40 | Quartzite celt, *l.* 163 mm. Pl. XV(*b*) | B |
| 47 | Marble ringstone, *dia.* 84 mm. *ht.* 39 mm. Pl. XV(*b*) | A 1 |
| 73 | Steatite seal, *l.* 24 mm. Pierced lug on back. Shows vulture with foot on snake. Small circular hole near the bird's head. Pl. XV(*f*). | G [1] |
| 78 | Conical limestone weight *ht.* 215 *dia.* of base 123 mm. Bored obliquely from two sides near top to permit insertion of rope for handle. Two similar weights in the McMahon Museum, Quetta from Nichara and a similar one found in 1925-26 at Mohenjo-daro; found with Group G. Slightly damaged. Present weight 17 lbs. 5 oz. 2 drams. Pl. XV(*b*) | A |
| 79 | Slate chisel, *l.* 101*b*. 16 mm. Found with Group F. Pl. XXI, 17 | A 7 |
| 80 | Stone chisel, *l.* 84 mm. *b.* 14 mm. Found near burial group in G 3. Pl. XXI, 18. | G 3 |
| 81 | (1) Quartzite grinding stone, *l.* 122 mm. *b.* 85 mm. (2) Carefully cut conical sandstone grinder, *l.* 87 mm. Both found under floor of G 2. Pl. XV(*b*) | G 2 |
| 82 | Part of heavy stone sphere with small circular projection; bottom flattened, *dia.* 71 mm. *ht.* 60 mm. | |
| 83 | (1) Grinding stone 230×126×66 mm. Has been carefully dressed on all sides save the bottom. Pl. XV(*b*). (2) Stone grinder, *l.* 62 mm. Very carefully cut | A 1 |
| 84 | Rubbing stone, *l.* 106 mm. | A 1 |
| 85 | Small oval pounding stone, *dia.* 42 mm. Very heavy | A 1 |
| 86 | Celt much chipped. Limestone, *l.* 219 mm. *b* 73 | Surface of mound. |
| 87 | Spherical limestone ball, *dia.* 60 mm. | |
| 88 | Fragment of marble mortar, *dia.* 73 mm. | D |
| 89 | Roughly spherical pounding stone, *dia.* 76 mm. | D |
| 90 | Neatly cut rubbing stone, *l.* 71 mm. *b.* 50 | D |
| 91 | Much damaged roughly spherical stone ball, *dia.* 40 mm. | D |
| 92 | Spherical sandstone pounding stone, *dia.* 78 mm. | D |
| 93 | Greenish grey pounding stone, *dia.* 106 mm. | D |
| 94 | Conical grinder, quartzite, *l.* 93 mm. | D |
| 95 | Spherical stone ball, *dia.* 50 mm. | D |
| 96 | Pounding stone with two flat sides, *dia.* 65 mm. *ht.* 45 mm. | D |
| 97 | Hemi-spherical limestone. Might be natural but the flat side has apparently been carefully rubbed, *dia.* 36 mm. | A |
| 130 | (1) Limestone grindstone 290×230×86 mm. Deep groove. (2) Limestone conical grinder, *l.* 87 mm. Both these found with burial H 4 and the red ferruginous earth No. 72. | A |
| 113 | Marble disc, one side polished, *dia.* 43 mm. Also fragment of similar disc polished on both sides. | |
| 115 | Small conical stone, bottom smooth as though used as a rubber, *ht.* 25 mm. | A |

(*c*) SHELL.

| | | |
|---|---|---|
| 58 | Small shell bangle, *dia.* exterior 47 mm. interior 36 mm. Has lost its sheen and looks like paste | E |
| 123 | Two fragments of bivalve sea shells | G |

G

## *List of Nāl Antiquities other than Beads and Pottery*—contd.

### (*d*) Bone.

70 Two fragments of worked bone. These fit together making a total length of 95 mm. Somewhat curved. Has three fine grooves parallel to each side on each face. *Cf.* worked bone found with Burial Group (Appendix V, p. 57) . . . . . G 2

16 Bone disc with hole in centre and groove round the rim as though used as a small wheel. Three parallel grooves on either face. Damaged, *dia.* 29 mm. . . D

### (*e*) Terracotta.

75 Fragment from rim of black bowl of Type 1 still showing ornament of swags. One end ground to a cutting edge and other pointed to imitate a copper tool. Seemingly funerary object, *l.* 82 mm. Cutting edge 23 mm. Pl. XXI, 16 . . .

89 Fragment of grey earthenware trimmed roughly to a circle, *dia.* 40 mm. Sepia lines D

90 Broken figurine humped bull, *l.* 40 mm. . . . . . . . . D

92 Broken figurine humped bull, *l.* 50 mm. . . . . . . . . D

93 Broken figurine humped bull, *l.* 65 mm. . . . . . . . . D

94 Broken figurine humped bull, *l.* 48 mm. . . . . . . . . D

95 Broken figurine humped bull, *l.* 66 mm. . . . . . . Sepia lines D

96 Broken figurine humped bull, *l.* 36 mm. . . . . . . . . D

97 Broken figurine humped bull, *l.* 47 mm. . . . . . . . D

98 Ill-shaped bobbin-like object, *ht.* 9 mm. *dia.* 9 mm. . . . . . . . D

99 Broken figurine humped bull, *h.* 33 mm. . . . . . . . . D

100 Irregular object of unbaked clay. Flat bottom. Pierced near to and parallel to bottom, *dia.* 28 mm. Possibly used as a bead . . . . . . . D

101 Fragment of earthenware roughly trimmed to a circle, *dia.* 27 . . . . . D

102 Object of unbaked clay resembling 100 . . . . . . . . D

103 Broken figurine of humped bull, *l.* 80 mm. Better fabric . . . . . A

104 Broken figurine of humped bull, *l.* 70 mm. Better sepia lines . . . A

105 Broken figurine of humped bull, *l.* 42 mm. do. . . . . . . . A

106 Broken figurine of humped bull, *l.* 53 mm. do. . . . . . . . A

107 Broken figurine of humped bull, *l.* 33 mm. do. . . . . . . . A

108 Broken figurine of humped bull, *l.* 40 mm. do. . . . . . . . A

109 Base of a small vessel trimmed to make a little saucer, *dia.* 42 mm. . . . A

110 Ring base of a broken vessel trimmed to make a little saucer, *dia.* 50 mm. . . A 3

112 Roughly circular disc bearing sixteen impressions made by a circular tubular object, *dia.* 57-60 mm. . . . . . . . . . . A

114 Fragment of greenish earthenware trimmed to a circle. Hole in centre, *dia.* 43-45 mm. A

116 Broken figurine of bull, *l.* 38 mm. . . . . . . . . . D

117 Broken figurine of bull, *l.* 85 mm. sepia lines . . . . . . . E

118 Broken figurine of bull, *l.* 63 mm. Has better sepia ornament than on the other figurines. Pl. XXI, 11 . . . . . . . . . . . E

119 Broken figurine of bull, *l.* 31 mm. sepia lines . . . . . . . F

120 Broken figurine of bull, *l.* 63 . . . . . . . . . . F

121 Figurine of bull, *l.* 44 little circular impressions on hump . . . . F

122 Broken figurine of ram, *l.* 66. Pl. XXI, 9 . . . . . . . F

### *List of Nāl Antiquities other than Beads and Pottery*—concld.

(*e*) Terracotta—*contd.*

124 Curious little figure. Rudimentary face, two arms outstretched, no legs, but small splayed circular base, possibly intended for human figure. The nose has been made by pressing the clay between the thumb and forefinger. Impressions of these still remain. Pl. XXI, 19 . . . . . . . . . . A

Miscellaneous—

(*a*) A polished barrel-shaped stone pale green possibly an unpierced bead 34 mm. Found in spoil earth of A.

(*b*) A small oblong shell bead pierced at either end parallel to the short sides. 10 mm. Spoil earth of A.

(*c*) A small shell bead, *dia.* 9 mm. Spoil earth of D.

(*d*) Four beads. 2 barrel shaped agate, 1 broken carnelian and one thin small shell ring, *dia.* 9 mm.

(*e*) A rough marble cylindrical bead 23 mm.

## APPENDIX II.

### *Beads.*

From Area A.—

A 1. 13 pale banded agate graduated bi-conical beads. Three unpolished Pl. XV(*a*).

A 2. 15 beads :—3 carnelian and 10 agate bi-conical beads of different sizes, 1 unpolished bi-conical and 1 barrel-shaped limestone bead. Pl. XV(*a*).

A 3. 57 beads :—54 very small white paste discs, 1 small lapis lazuli and 2 flat carnelian.

A 4. 14 beads :—6 carnelian, 6 paste of which two have a green glaze and 2 flat irregular hexagonal agate. Pl. XV(*a*).

A 5. 20 beads :—9 small white disc paste, 7 cylindrical paste, 3 barrel-shaped shell and one flat pale green bead.

A 6. 27 beads :—6 thin paste discs, 6 paste cylinders, 6 lapis lazuli, 3 barrel-shaped shell, 1 thin flat dark stone, 1 paste cylinder half brown and half white, 2 cylindrical black beads, 2 bi-conical agate.

Area G.—

G 7. 26 graduated bi-conical and barrel-shaped agate beads. Pl. XV(*a*).

G 8. 15 carnelian beads, 12 bi-conical and three bi-hexagonal. Pl. XV(*a*).

G 9. 17 beads :—7 small flat carnelian, 3 lapis lazuli (each in two pieces) irregular hexagonal, 7 agate flat hexagonal. Pl. XV(*a*).

G 10. 27 beads :—26 white paste, flat, cylindrical and discoid, 1 cylindrical shell.

G 11. 60 lapis lazuli beads :—59 cylindrical and discoid beads and half of a flat hexagonal bead. Pl. XV(*a*).

Area E—

E 12. 14 beads and pear shaped crystal pendant. Pl. XV, 2, 10 barrel shaped white beads with grey ends, 2 bi-conical agate, 1 small barrel-shaped agate and a bi-hexagonal carnelian. Found in infant's grave in A 13. Pl. XV(*a*).

E 13. 89 minute discoid paste beads found with a small skull in A 13.

E 14. 17 beads :—12 agate (10 bi-conical or barrel-shaped, 2 irregular) 4 carnelian bi-conical or barrel shaped and 1 carnelian barrel-shaped with one flat side. Pl. XV(*a*).

Room F.—

F 15. 6 beads :—2 shell, 1 small carnelian, one marble barrel-shaped, one bone and one paste

## APPENDIX III.

*Mineral Ores, etc.*

| | |
|---|---|
| 39. Cerussite associated with Cuprite | D |
| 65. Cerussite (carbonate of lead) | D |
| 66. Cerussite (carbonate of lead) | A |
| 67. Cerussite (carbonate of lead) | D |
| 68. Galena (sulphide of lead) | A 3 |
| 72. Small moulded cake of ferruginous earth containing a large proportion of quartz. Might be natural but possibly formed by the calcination of yellow ochre | A 1 |
| 98. Yellow ochre (ferric hydroxide), associated with quartz. Found with burial Group H 4 | A 12 |
| 99. Red ochre, iron sesqui-oxide | A 7, A 12 |
| 100. Leaden slag. Analysis below. | D & F |
| 101. Lollingite, ore of iron and arsenic. Analysis below (apparently calcined) | D |

A fragment of the leaden slag, No. 100, from Area D and of the ore of Iron and Arsenic, No. 101, from the same area and which is stated to be the mineral Lollingite together with No. 38, the end of a copper implement were submitted to Mr. Muhammad Sana Ullah, M.Sc., F.C.S., Archæological Chemist, whose analysis of each is given below: To him we are also indebted for the identification of the mineral ores given in this appendix.

*(a) Analysis of Lollingite. Ore of Iron and Arsenic.*

| | Per cent. |
|---|---|
| Fe | 49·3 |
| As | 43·6 |
| $H_2O$ | 4·7 |
| Cu | 0·7 |
| S | 0·16 |
| Gangue | 0·8 |
| TOTAL | 99·26 |

*(b) Analysis of leaden slag from Area D.*

| | Per cent. |
|---|---|
| $SiO_2$ | 30·97 |
| Pb O | 55·00 |
| $Fe_2O_3 + Al_2O_3$ | 10·26 |
| Ca O | 3·90 |

*(c) Analysis of copper adze No. 38.*

| | Per cent. |
|---|---|
| Cu | 93·05 |
| Pb | 2·14 |
| Ni | 4·90 |
| Sn | *nil.* |
| Fe | *nil.* |
| As | traces |
| TOTAL | 100·09 |

Its somewhat light colour is due to the presence of nickel 4·90 % and lead 2·14 %. These two metals were probably present in the copper ores which were employed for the extraction of the metal.

# APPENDIX IV.

## *List of pottery recovered at Nāl.*

The letter T denotes the type represented on Plate XVI and D the designs given on Plate XVII. H is height in milimetres.

*Type 1 (a)*.—Open bowl with ring base. Twenty-one specimens ranging in height from 43 to 77mm. Grey or buff ware with brownish red or black slip, the colouring apparently due to uneven firing. Two specimens with brown slip. Thickness varies from 3 to 3½ mm. All plain save G 3 (16) which has in interior a simple design in white resembling D41. Porosity great. Found in all parts of the necropolis.

1. *Gp. G11* grey ware. Slip black and red in patches. H62.
2. *Gp. G17* grey ware. Black. slip. H77.
3. *Gp. G.* 18 grey ware. Black slip missing in parts. Broken, repaired H 64.
4. *Gp. E1* grey ware. Slip black and red. H 62.
5. *Gp. E 5* grey ware. Black and red slip. H 43.
6. *G 3, 14* grey ware. Dark red slip missing on parts of brim, H 69.
7. *G 3, 15* greyish buff ware. Dark red slip. Side chipped. H 60.
8. *G 3, 16* grey ware. Dark brown slip. D 41 inside round the brim. H 68.
9. *G 3, 19* grey ware. Black slip missing inside bowl. H 49.
10. *B 3* grey ware. Red slip inside but red and black in patches on exterior. H 72.
11. *B 9* greenish grey ware. Black slip but part missing. Brim chipped. H 68.
12. *B 11* grey ware. Black slip. Brim damaged. H 70.
13. *R 4, 6* grey ware. Black slip missing in parts on exterior. H 69.
14. *R 4, 8* grey ware. Black and red slip. Damaged rim. H 64.
15. *C 1, 1* grey ware. Slip dark red almost black. Edge chipped. H 62.
16. *A 24* grey ware. Slip red and black in parts only. Cracked. Piece missing from brim. H 73.
17. *A 93* grey ware. Black slip which is brownish red in parts. H 68.
18. *E 42* grey ware. Reddish brown slip. H 72 Pl. XVIII, 1.
19. *F 3* light buff ware. Reddish brown slip. Rim broken. H. 53.
20. *F 4* light buff ware. Red slip. H 56.
21. *F 6* grey ware. Black slip which is reddish brown on parts of exterior. H 56.

*Type 1 (b)*.—Open bowl resembling 1(*a*) but with straighter sides sloping to ring base. Nineteen specimens from 42 to 79mm. in height. All save one from Trench E. Grey, greyish black or red ware usually with black slip but with red more rarely. Walls very thin from 1¼ to 3mm. Even best fired specimens somewhat porous. Complete specimens give a metallic ring. Ornament usually simple lines on the exterior but two have similar lines inside the bowl.

22. *E 19* buff ware. Slip greyish black interior but reddish on exterior. Very thin walls. Edge 1mm. Two white lines exterior. H 54.
23. *E 20* buff ware. Greyish black slip. Three black lines exterior. Thin walls. H 53.
24. *E 23* buff ware. Red slip. Thin walls. Two black lines exterior. H 57.
25. *E 24* greyish black ware. Three black lines exterior. Thin walls. Broken. H 58.
26. *E 25* grey ware. Greyish black slip. Two pairs black lines exterior. Thin walls. Marks of tool on exterior. H 42.

*List of pottery recovered at Nāl*—contd.

27. *E 28* red ware. Edges blackened. Three dark chocolate lines exterior. Damaged. Thin walls $1\frac{1}{4}$ to 2mm. H 55.

28. *E 29* thin grey ware. Greyish black slip. Two white lines exterior. H 51.

29. *E 30* thin grey ware. Black slip almost entirely lost. Rim broken. H 59.

30. *E 31* buff ware. Greyish black slip. Thin walls. White line exterior. H 55.

31. *E 32* grey ware. Greyish black slip. Three black lines interior. Gives metallic sound when struck. H 79. Edge chipped. Pl. XVIII, 2.

32. *E 34* buff ware. Greyish black slip red in parts. Two chocolate lines exterior. Thin walls. H 56.

33. *E 35* grey ware. Greyish black slip. Two faint black lines exterior. Thin walls. H 47.

34. *E 37* greyish buff ware. Black slip. Three black lines. Rim damaged. H 59.

35. *E 38* grey ware. Slip black exterior, red interior, white lines interior. Thicker walls than rest of Type 1(*b*). Two pieces, rejoined. H 79.

36. *E 39* buff ware. Greyish black slip. Thin walls. Two chocolate lines exterior. Rim chipped. H 57.

37. *E 40* buff ware. Two white lines exterior. Rim damaged. Repaired. Thin walls. H 55.

38. *R 1, 3* grey ware. Black slip. Three white lines exterior. Thin walls. H 53.

39. *Gp. G 6* grey ware. Black slip. White line exterior. H 58.

40. *Gp. G 10* grey ware. Greyish black slip in parts. Two white lines exterior. H 51.

*Type 1* (*c*).—Open bowl, upper part resembles 1(*a*) lower part 1(*b*). Twenty-eight specimens varying in height from 34 to 147mm. Grey or buff ware, one specimen of red ware. Black or red slip. None decorated exteriorly but many have white or black lines or simple ornament inside. Two show on exterior marks of dressing with some tool. Very porous.

41. *B 17* pale buff ware. Black slip. Circle in white interior. H 72.

42. *B 21* buff ware. Greyish black slip red in places. Slip missing in parts. On exterior marks of a tool used to dress the clay. H 74.

43. *B 22* buff ware. Red slip. H 77.

44. *B 24* (1) pinkish ware of biscuit-like texture. Contained another vessel B 24 (2). H 134.

45. *E 21* buff ware. Reddish slip. Three white lines interior. H 65.

46. *E 22* buff ware. Red slip. Interior ornament of lines and D 5. H 82.

47. *E 33* buff ware. Black slip with red patches. Three white lines interior. H 58.

48. *E 36* buff ware. Red slip blackened in places. Black ornament of D 5 and lines. Rim damaged and repaired. H 72.

49. *E 41* buff ware. Greyish black slip. Rim chipped. H 60.

50. *Gp. E 2* buff ware. Greyish black slip missing in parts. H 68.

51. *Gp. E 3* buff ware. Red slip blackened on rim. Rim damaged. H 82.

52. *Gp. E 14* reddish grey ware of biscuit-like texture. Resembles B 24(1) No slip. Rim damaged. H 147.

53. *R 1, 1* buff ware. Black slip, red in parts. Three white lines interior. H 71.

54. *R 1, 10* buff ware. Black slip. White lines and D 44 thrice. H 90. Pl. XVIII 3.

55. *R 1, 12* buff ware. Grey black slip. D 41 interior. H 67.

56. *R 4, 7* buff ware. Black slip red in parts. H 73.

57. *R 5, 3* buff ware. Red slip. Two white lines interior. H 63.

58. *R 5, 5* buff ware without slip. Sepia lines and chevrons repeated thrice interior. H 34.

*List of pottery recovered at Nāl*—contd.

59. *G 3, 7* grey ware. Blackish grey slip in parts only. H 86.

60. *G 3, 9* red ware. Red slip blackened on rim and one side. H 67.

61. *G 3, 10* buff ware. Dark red slip almost black in parts H 79.

62. *G 3, 11* grey ware. Blackish grey slip. H 78.

63. *G 3, 12* grey ware. Red slip black in parts. H 66.

64. *G 3, 13* grey ware. Greyish black slip missing in parts. H 76.

65. *G 3, 17* grey ware. Black slip red in parts. Rim broken H 62.

66. *G 3, 18* buff ware. Greyish black slip. Rim chipped. H 57.

67. *Gp. G 4* grey ware. Greyish black slip. Two white lines interior. H 65.

68. *Gp. G 8* buff ware. Greyish black slip. Lines and D 5 in black in interior. Slightly distorted. Marks of beating by tool on exterior. H 76.

*Type 1 (d).*—Open bowl resembling 1(*c*) but with a short slightly everted brim. Nine specimens from all parts of necropolis. Height varies from 52 to 137mm. Buff and reddish buff ware with red or black slip. Simple interior ornament all in white, D 9, 15, 41, 42, 43.

69. *A 91* buff ware. Greyish black slip. In interior white square with diameters repeated thrice and circle at base. H 68.

70. *A 92* buff ware. Black slip. D 41 interior. Damaged. H 69.

71. *Gp. G 13* buff ware. Slip red and black. In interior white line and D 9 repeated thrice. H 79.

72. G *3, 8* buff ware. Black slip. White lines interior. Cracked. H 77.

73. *R 1, 2* buff ware. Greyish black slip. White lines and D 42 thrice interior. H 66.

74. *R 4, 1* buff ware. Black slip. Interior D 43 in white. Fine vessel in two pieces, rejoined. H 137.

75. *R 5, 2* buff ware. Greyish black slip. Interior D 41 in white. H 75.

76. *R 5, 4* reddish buff ware. Red slip. Lines and D 15 repeated thrice in white in interior. H 52.

77. *R 7, 6* buff ware. Red and black slip. In interior D 41 and lines in white. H 77. Pl. XVIII, 4.

*Type 2.*—Open bowl not unlike 1(*c*) but having a raised projection about 40mm. below and parallel to the brim. Thirteen specimens varying in height from 61 to 87mm. Buff ware. Between the raised projection and the brim a narrow band of ornament, D 17-21 or D 51 usually polychrome, in red, blue and yellow. The blue is rarely preserved. Below the projection and inside the bowl a slip either red or black but occasionally of chocolate colour. These vessels were found in A 1, 3, 5, 6 only.

78. *A 94* buff ware. Reddish black slip inside and out. D 17 between lines. H 65.

79. *B 4* buff ware. Chocolate slip D 20 in red and yellow. H 78.

80. *B 7* grey ware. D 17 in blue, yellow and red on brim. Red slip below ornament and in interior. H 87. Pl. XVIII 5.

81. *B 8* grey ware. D 15 in red and yellow but with double lines. Red slip exterior and interior. H 82.

82. *B 19* buff ware. D 18 in red and yellow. Red slip exterior and interior. H 78.

83. *B 27* greyish buff. D 19 in polychrome but colours red and yellow only faintly preserved. Black slip. H 72.

84. *B 28* buff ware. D 17 in red and yellow. Red slip H 76.

*List of pottery recovered at Nāl*—contd.

85. *B 30* reddish ware. Red slip. D 51 in red and yellow but with double lines instead of solid black. In three pieces. H 81.

86. *C 7, 3* buff ware. Red slip. Upper portion of D 21 with traces of red and yellow. H 74.

87. *Gp. E 4* buff ware. D 20 in sepia outline. All colour of design is lost save a pale yellow slip. Red slip on remainder of vase. H 61.

88. *R 3, 2* greyish buff ware. D 17 of which only traces of red colouring preserved. Red slip. Rim damaged. H 64.

89. *R 3, 3* buff ware. D 21, upper part only, in sepia outline. Half of vessel preserved. H 78.

90. *R 5, 1* greyish buff ware. D 20 in red and yellow. Chocolate slip. H 73.

*Type 3.*—Basin-like vessel with straight sides. Thirty nine specimens varying in height from 23 to 86 mm. All but five with ring bases. Found in all parts of the necropolis. Buff or red ware. Polychrome specimens often have white slip. Exterior ornamented with lines, bands or panels. Great variety of designs, *viz.*, T 13, 17, 18, 20, 21, 24, 36, 37, 38, 40, 49, 51, 62. One vessel has raised bosses in the centre of the circles of D 36.

91. *A 2* buff ware. Sepia lines exterior. H 32.

92. *A 3* buff ware. Sepia lines exterior. H 33.

93. *A 21* fine buff ware. D 37 repeated exterior. H 68.

94. *A 22* buff ware. Sepia line inside brim and two lines on exterior. H 35.

95. *A 23* buff ware. D 17 in red, yellow and blue. H 41.

96. *A 48* buff ware. Fine vessel perfectly preserved. Four panels of D 24 on exterior. Traces of colour. H 61.

97. *A 84* buff ware. Plain. Rim damaged. H 34.

98. *A 87* buff ware. One sepia line interior, three exterior. Has no ring base. H 23.

99. *A 89* buff ware. D 49, D 13 and lines in sepia on exterior. H 62.

100. *A 90* greyish buff ware. Undecorated. H 70.

101. *Gp. A 1* buff ware. Faint traces only of D 38. H 68.

102. *Gp. A 3* buff ware. Ornament in black, yellow and red of D 38 and a leaf alternately in four panels. Colours well preserved. H 56.

103. *Gp. A 5* buff ware. D 51 in red, yellow and black. H 33.

104. *B 14*(*a*) buff ware. Damaged. Found inside B 14. H 33.

105. *B 15* buff ware. Sepia ornament of D 49, D 13 between and separated by double line. H 78. Pl. XVIII, 6.

106. *B 24* (2) buff ware. D 40 in sepia. H 59.

107. *B 26* buff ware. In sepia D 49 and D 13 separated by and between lines. H 54.

108. *C 2, 2* buff ware. D 51 in red, yellow and black. Damaged and colours faint. H 36.

109 *C 6, 1* buff ware. Traces of D 51 in yellow and red. Rim damaged. H 38.

110. *C 7, 1* red ware. D 20 in sepia. H 55.

111. *Gp. E 6* buff ware. D 36 (slightly modified), repaired H 65.

112. *Gp. E 7* buff ware. Continuous design in red and yellow of left panel of D 36. Shallow boss in centre of each circle. Colours well preserved. H 64.

113. *Gp. E 9* reddish ware. Decoration lost. H 31.

114. *G 3, 4* red ware. Bands of D 49, D 13. D 49 in red, yellow and blue, separated by lines. H 86.

115. *G 3, 5* buff ware. D 49 over three fishes (D 62) and between lines. Colours lost. H 78.

*List of pottery recovered at Nāl*—contd.

116. *G 3, 20* buff ware. Modification of D 20 in red, blue and yellow. Rim damaged. H 40.

117. *G 3, 21* red ware. Upper part of D 21. Colour lost. H 32.

118. *G 3, 22* buff ware. D 18. Only red colour preserved. H 31.

119. *G 3, 23* reddish buff ware. Plain H 38.

120. *Gp. G 12* buff ware. Three sepia lines exterior, no ring base. Hole in centre of base. H 32.

121. *Gp. G 15* red ware. Three sepia lines exterior. H 34.

122. *Gp. G 16* greyish buff ware. Design lost. H 38.

123. *R 1, 4* buff ware. D 17 in red and yellow. Damaged. H 33.

124. *R, 1, 5* buff ware. Band on rim. H 32.

125. *R 5, 7* buff ware. D 36 repeated twice. Colours red and yellow. H 72.

126. *R 7, 2* red ware. D 20 in red and yellow. H 35.

127. *R 7, 9* buff ware. Traces of two black lines. H 35.

128. *R 11, 1* reddish ware. D 18 in red and yellow. H 31.

129. *R 11, 2* reddish ware. D 17 in red and yellow. H 34.

*Type 4.*—Tumbler-like vessel. Two specimens ranging from 60 to 80mm. in height. Both from A 7, but a broken specimen was found in G 3. One vessel buff ware, the other red. The buff specimen full of free lime and having striations inside and out made by some cutting tool when turned. No ornamentation.

130. *R 7, 1* red plain ware. Unevenly fired. Brim chipped. Repaired. H 60.

131. *R 7, 4* grey plain ware. Contains free lime, white spots of which are visible in the fabric. Marks inside and out of cutting tool. H 80. Pl. XVIII 7.

*Type 5.*—Canister-like vessel with circular opening. Twelve specimens recovered varying from 51 to 93mm. in height. Not more than one ever recovered in any one burial group. Greenish grey, buff and red ware. White slip under ornament which is sometimes polychrome, red, yellow and blue. Patterns on top and sides. On top these are D 1, 21, 29, 34, 52, on sides D 5, 10, 26, 33, 34, 36, 39 with fishes in pairs, 49, 54, 56, 62. This form is not a true pottery shape and sometimes the top sinks before firing and the straight sides bend inward Pl. XVI, 5. Such vessels would appear to require lids such as No. 16 of Pl. XVI, but none were found with them.

132. *A 11* red ware. White slip. On top in sepia modification of D 52. On sides D 33 between double lines. H 51.

133. *Gp. A, 6* buff ware. Top missing. In sepia on exterior D 56 between lines. H 51.

134. *C 4, 1* red ware. All ornament lost. H 79.

135. *E 46* greyish buff ware. On top D 1 on sides two lines and D 10 in sepia. H 62.

136. *F 5* buff ware. Polychrome, red and yellow. On top D 21 without O-megas. Colours faint. On sides D 36 abbreviated and repeated twice. H 63.

137. *Gp 1, 2* buff ware. Traces of blue, red and yellow. On top D 29 modified, on sides D 26 H 74. Pl. XVIII, 8.

138. *Gp. D 1* pale buff ware heavier than usual. On top D 21 without O-megas. Black, yellow and red on top but only traces on sides of which D 5 is preserved on upper edge. Sides have been roughly dressed with a cutting implement. H 85.

139. *Gp. G 5* greyish buff ware. White slip. Magnificent specimen of which design D 34 on top and sides is perfectly preserved. Traces only of red and yellow filling. H 90. Pl. XX (*c*).

140. *G 3, 6* red ware. Much damaged. Top pattern lost. Face has traces only of D 49 and

*List of pottery recovered at Nāl*—contd.

fishes. H 87.

141. *R 1, 11* red ware. On top in sepia modification of D 29, on face D 54 between double lines. H 76.

142. *R 5, 6* buff ware. On top D 21 without O-megas, on face four panels, *viz.*, pair of fishes one above the other, then D 39 in next panel. Both panels repeated. H 93.

143. *B 14* buff ware. Pattern destroyed by salt but was probably panels with leaves. H 80.

*Type 6.*—Open bowl with straight sides and ring base. Usually the sides are vertical but slight variations occur such as curving or splaying towards the base. Walls generally thin resulting in occasional distortions in firing. Grey, buff and fine red ware. In some cases pale buff slip. Thirty four specimens varying in height from 56 to 99mm. Most numerous in Trench E. Designs usually in sepia but a plain red band occurs on five specimens. Designs usually simple and geometrical, *viz.*, D 1, 4, 6-8, 26-31, 35, 46-48, 52, 57, 63. Only one vessel, Gp. G 2 was polychrome having the intersections of the circles, D 35, alternately red and yellow.

144. *A 8* red ware. In sepia three parallel bands of D 1. H 70.

145. *A 9* fine buff. Modification of D 26. Two lines inside brim ; broken. H 67.

146. *A 10* fine red ware. Over pale buff slip D 46 in black. H 63. Pl. XVIII, 10.

147. *A 82* fine red ware. Pale buff slip. In sepia D 27 between triple lines. H 99.

148. *A 95* buff ware. In black D 26 reversed. H 59.

149. *E 1* pale buff ware. In sepia lines and D 8. H 73.

150. *E 2* pale buff ware. Red band between two black lines. Below this D 7 in black. H 70.

151. *E 3* pale buff ware. In sepia six lines. D 8 and two lines. H 91.

152. *E 4* red ware. Pale buff slip. In sepia below three lines D 7, D 1, D 7 separated by lines. H 84.

153. *E 5* buff ware. In sepia under three lines D 1 and line repeated twice. H 81.

154. *E 6* pale grey ware. In sepia two lines and D 1 repeated twice. H 72.

155. *E 7* red ware. Pale buff slip. D 1 twice separated by lines and red bands. H 74.

156. E *8* fine red ware. Pale buff slip. Red band between two black lines. Below this D 1 and red bands repeated twice. H 69.

157. *E 26* greyish buff ware. In sepia D 47 between lines. H 72. Pl. XVIII, 11.

158. *E 44* reddish buff ware. Pale buff slip. Six lines, D 7 and two lines in sepia. H 76.

159. *E 45* grey buff ware. In sepia five lines, D 7 and one line. H 63. Damaged.

160. *E 47* grey buff ware. In sepia three lines. D 1 and two lines. H 59.

161. *E 48* fine red ware. Pale buff slip. Two bands of D 52. H 92. Distorted.

162. *E 51* reddish buff ware. Modification of D 31 between lines. H 75. Pl. XVIII, 13.

163. *E 52* greenish buff ware. Five lines. D 7 and one line. H 66.

164. *E 53* buff ware. Band on brim then D 6 twice separated by line. H 65.

165. *E 54* pale buff ware. Band on brim, four lines and D 8. H 63.

166. *E 55* buff ware. D 4 between triple lines. H 67.

167. *E 56* greyish buff ware. D 4 between lines. H 76.

168. *E 57* reddish buff ware. D 5 in sepia between lines and red bands. H 70.

169. *Gp. 1, 3* fine red ware. D 48 between single lines. Red band inside brim. H 60.

170. *Gp. G 2* fine red ware. Interlaced circles D 35. When found had red and yellow alternately in the intersections. Much damaged. Repaired. Part of design lost. The exterior has a black base and pale buff coat on which the design is drawn. The circles are not perfect but the design seems to have been plotted mechanically . H 83. Pl. XX (*d*).

*List of pottery recovered at Nāl*—contd.

171. *Gp. G 3* buff ware. D 1 between triple lines. Chipped. H 63.

172. *Gp. G 7* pale buff ware. Two bands of D 57 between lines; distorted. H 74. Pl. XVIII, 12.

173. *Gp. G 9* fine reddish buff ware. Two lines and D 5 repeated twice. H 62.

174. *R 1, 6* buff ware. White slip. Modification of D 30 between double lines. H 68.

175. *R 1, 7* fine reddish buff ware. Four panels with Sind ibex (D 63) and Persian gazelle alternately. In one intervening panel step pattern and circles, the other broken. No colour preserved. H. 56. Pl. XVIII, 9.

176. *R 4, 3* buff ware. Broad reddish band inside brim. On exterior D 29 between lines. H 63.

177. *R 5*, 12 fine buff ware. D 28 between lines. H 57.

*Type 7.*—Elliptical bowl with wide mouth. From the point of greatest curvature to the ring base the sides have been trimmed by a cutting tool, leaving a well-defined sharp edge. Above this is ornamentation, usually polychrome. Twenty-five specimens from 83-117 mm. in height. Greenish grey, buff or pinkish ware due probably to differences in firing. Only one specimen found in Trench E. Ornamentation consists of bands of D 5, 13, 20, 21, 30, 38, 40, 49 or panels such as D 24, 36 or fishes. The colours are red, yellow, blue and black but not more than three occur on any vase.

178. *Pass. 1* reddish buff ware. On pale yellow ground band of D 20 over band of O-megas D 13. Red and yellow filling and red and blue lines. Blue O-megas. H 105.

179. *A 28* greyish buff ware. D 36 repeated twice. Colours yellow and red and faint traces of blue. H 89. Pl. XX(*a*).

180. *A 34* pink ware. D 49 and D 30 separated by double lines. Only traces of yellow colour preserved. Rim damaged. H 99.

181. *A 36* pale buff ware. Four panels with conventional leaf, D38, D 13, D 38 respectively. Colours red, yellow and black. Damaged. H 36.

182. *A 88* greyish buff ware. D 49, line and band of D 13. Colours red, blue, yellow, damaged H 97.

183. *Gp. A 4* greenish ware. Part of design lost but appears to have been D 38 in black with alternate red and yellow filling. H 100.

184. *C 2, 1* buff ware. Four panels. Two panels with D 36, third panel part of left of D 36. fourth panel a fish. Colours red, yellow, blue. H 83.

185. *C 3, 1* buff ware. D 5 and D 13 with double lines below each. Only yellow and red colour preserved. H 90.

186. *B 6* buff ware. D 21 and two lines. Colours red, blue, yellow. H 101.

187. *B 10* buff ware. D 49 and D 13 with two lines below each. Colours red, yellow and traces of blue. H 93.

188. *B 12* grey ware. Part of ornament lost by peeling of slip but seemingly D 36 repeated twice. H 102.

189. *B 13* pale red ware. D 40. Yellow background, red filling between the lines and blue top and bottom lines. H 93.

190. *B 16* buff ware. D 49 and D 13 separated by double lines. Red and yellow colouring. Damaged. H 91.

191. *B 20* buff ware. D 21 in red, yellow, blue. H 95.

192. *Gp. E 8* pale red ware. D 36 repeated twice. Outlines only. Possibly never was coloured. H 93.

*List of pottery recovered at Nāl*—contd.

193. *Gp. 1, 1* red ware. Pale buff slip. D 62. Fishes have red tails and fins. Much damaged, repaired. Colours red and yellow. H 102.

194. *Gp. F 1* greyish buff ware. Four panels, three being modifications of D 36, the fourth containing a leaf, D 24. Colours red and yellow. Blue seemingly lost. *Cf.* A 36. H 88.

195. *G* 3, *1* red ware. D 49 over five fishes. Fishes vary in size. Colours red, blue, yellow. Rim damaged. H 110. Pl. XX (*b*).

196. *G 3, 2* grey ware. Grey slip. Has not been coloured. D 49 over D 62 (five fishes). H 117.

197. *G 3, 3* pale buff. No colour. D 49 and D 13 each over two lines. H 95.

198. *R 1, 13* reddish buff ware. D 36 repeated twice. Colours red, yellow, blue. H 87.

199. *R 3, 1* pale red ware. D 36 repeated twice. Colours, red and yellow. Of blue only traces. H 90.

200. *R 4, 2* buff ware. D 36 (modified) repeated twice. H 89.

201. *R 4, 5* pale red ware. D 49 and D 13 each over double lines. Only faint traces of colour. H 94.

202. *R 7, 8* red ware. D 5 and D 13 with lines below each. Pale buff slip. Has never been coloured. H 100. Pl. XVIII, 14.

*Type 8.*—Open bowl similar to Type 7 but larger and having a well-marked raised triangular edge at the greatest diameter. Ring base. Two specimens 124 and 130mm. in height, both from Group B. Buff ware. Polychrome ornament, a band of D 49 in one case, in the other six panels of D 25 alternating with the left panel of D 36.

203. *B 23* buff ware. Six panels D 25 and left panel of D 36 alternately. Colours red, yellow, blue. H 124. Pl. XVIII, 15.

204. *B 32* buff ware. D 49 and D 13 each over two lines. Colours red, yellow, blue. H 130.

*Type 9.*—Squat pot with bulging sides meeting in a sharpish edge. Greatest diameter about one-third above base. Small everted rim. Seven specimens from 42 to 84mm. in height. Buff and red ware, occasional white slip. Found in most parts of the necropolis. Ornament in sepia principally simple and geometrical being D 1, 4, 16, 28, 30, 31, 54 or modifications of these.

205. *C 6, 2* buff ware. In sepia D 16. H 42.

206. *E 11* red ware. Lines, modification of D 1 over D 4 with cross hatched lozenges. H 54.

207. *E 50* reddish buff ware. Modification of D 54 between lines. H 56.

208. *E 58* reddish buff ware. Pale slip. D 30 between lines. Pl. XVIII, 16.

209. *R 1, 14* red ware. Pale slip. D 16 and band. H 40.

210. *R 5, 9* red ware. Two lines and D 28 reversed. H 61.

211. *R 7, 7* fine red ware. D 21 between lines. H 84.

*Type 10.*—Squat pot resembling Type 9 but without ring base. Ten specimens 37 to 67mm. in height. Most found in Trench E. Grey, buff and red ware. White slip. Ornament in sepia usually simple bands, D 1, 2, 4, 7, 22, 32 but one specimen has D 51, the scorpion, repeated thrice. This vessel has three holes for suspension near the brim.

212. *A 64* buff ware. White slip. In sepia between lines the scorpion, D 58, thrice. Close to brim three holes for suspension. Found left of Group A. H 55.

213. *E 10* reddish buff ware. White slip. Five lines in sepia. H 37.

214. *E 12* fine red ware. Had white slip but only traces preserved. In black, D 32 and two lines. H 58.

215. *E 13* fine red ware. White slip. In sepia two parallel lines, one band D 1, over D 22,

*List of pottery recovered at Nāl*—contd.

H. 67. Pl. XVIII, 17.

216. *E 14* red ware. White slip. Five lines and D 4 with reversed hatching. H 59.

217. *E 15* buff ware. White slip. Six parallel lines in sepia. Execution rough. H 58.

218. *E 16* buff ware. White slip. D 7 between lines. H 52.

219. *E 17* buff ware. D 2 (with reversed hatching) under double line. Brim vertical. H 48.

220. *Gp. G 14* buff ware. Four sepia lines. H 40.

221. *R 4, 4* red ware. Four sepia lines. H 52.

*Type 11.*—Squat pot without brim or ring base. Five specimens 30 to 42mm. in height. Grey and red ware. Often with white slip. Ornament in sepia only, D 2, 9, 12. One vessel A 12 has remains of what may have been a lug pierced horizontally, another, *C 6* (3) is apparently half of a double vessel. *Cf.* Type 12.

222. *A 12* red ware. Buff slip. The only vessel possessing traces of a lug pierced horizontally. H 37.

223. *B 29* red ware. White slip. In sepia D 9. H 38.

224. *C 6, 3* grey ware. Plain. Apparently half of a double pot like Type 12. H 42.

225. *E 18* red ware. White slip. D 12 repeated thrice. H 41. Pl. XVIII, 18.

226. *R 5, 10* reddish buff ware. White slip, D 2 slightly modified. H 30.

*Type 12.*—Double pot with projecting flat handle. The individual vessels have more or less vertical sides. Handle has one or three holes near end possibly for thin stick. Height 46 mm. Buff ware, unornamented. Both specimens from A 1.

227. *A 4* buff ware. Sides slightly curved. Flat handle with three holes at end arranged triangularly. One vessel damaged. H 46.

228. *R 1, 9* buff ware, plain. One hole in flat handle. Vessels straight sided. H 46. Pl. XIX, 1.

*Type 13.*—Drinking cup with short solid foot. Brim everted. Three specimens 100 to 121 in height. Grey ware, reddish in parts. All from Room D 6. Ornamented with simple lines. Marks under foot showing the pot was cut off by a string from the clay on the wheel.

229. D *61* grey ware red in parts. Line on brim and four black lines about one third from top. Damaged. H 113. Pl. XIX, 2.

230. *D 61* grey ware. Sepia line on brim and three lines close together about middle of vessel. Broken. H. 121.

231. *D 63* grey ware, red in parts. Sepia line on brim and about two thirds below. This is divided into three panels by triple vertical lines. Damaged. H 100.

*Type 14.*—Little circular cup having the sides nipped to form four sharp corners like a four pointed lamp. (chiragh) Twenty-four specimens 24-50mm. in height. All save one found east of Room 7 or in Area G. Grey and red ware. Simple patterns in sepia, D 9, 12-16, sometimes slightly modified.

232. *A 25* grey ware. Line on brim and D 9 each face. H 35.

233. *A 26* grey ware. Double lines at corners, D 14 each face, double line below. H 35.

234. *A 27* red ware. Line on brim. In each face single loop of D 16. H 36.

235. *A 85* grey ware. Single line at corners, double chevron on each face. Line on brim and below. H 24.

236. *A 86* reddish buff ware. Line on brim. Double loop at corners, double chevron on each

*List of pottery recovered at Nāl*—contd.

face. H 33.

237. *A 97* grey ware. Line on brim and one below. Three chevrons on each face. H 31.

238. *Gp. A 7* red ware. Double loop at corners. D 14 on each face. Double line below. H 35.

239. *C 7, 2* red ware. Pale buff slip. Three loops at corners. H 38.

240. *E 59* greyish green ware. Three loops at corners. Rough double swag on each face. H 49.

241. *Gp. E 10* red ware. Double loop at corners, D 16 on each face. H 38.

242. *Gp. E 11* grey ware. Modifications of D 16 and D 12. H 32.

243. *Gp. E 12* grey ware. Sepia line on brim, four chevrons on each face. H 39.

244. *Gp. E 13* red ware. D 16 without enclosing lines. H 33.

245. *F 2* grey ware. Double loops at corners, D 14 on each face. Double line below. H 36.

246. *G 3,* 24 grey ware. Line on brim, D 14 on each face. H 40.

247. *G 3, 25* grey ware. D 15 and two lines below. H 36. Pl. XIX, 3.

248. *G 3, 26* grey ware. D 13 on each face. Flat bottom. H 33.

249. *R 1, 8* grey ware, plain, broken. H 50.

250. *R 4, 9* red ware. Broken line on each face. H 28.

251. *R 5, 11* grey ware. Line on brim, D 14 on each face, two lines below. H 50.

252. *R 7, 3* red ware. Pale buff slip. Three loops at corners. H 38.

253. *R 7, 5* red ware. Three chevrons on each face. Line on brim and double line below chevrons. H 44.

254. *T G 1* reddish ware. Modification of D 12. H 34.

255. *T G 2* grey ware. Double loop at corners and modification of D 12 on each face. H 35.

*Type 15*[1]—

256. *Gp. A 2.*—Elliptical pot with open mouth. No ring base. Ht. 74mm. Rough grey ware with free lime in the fabric. Three holes irregularly spaced below brim. Decorated between greatest diameter and brim with four pairs of fishes in sepia. Fishes vigorously treated and less conventional than D 62. Pl. XIX, 4.

*Type 16*—

257. *A 83* Lid with squatting animal (dog ?) as handle. Might have been lid of vessel of Type 5. *Ht.* 33mm. *dia.* 95mm. Grey ware with free lime. Light slip. Unornamented save for sepia lines on animal's head. Pl. XIX, 5.

*Type 17*—

258. *A 96* Miniature vessel with narrow mouth, resembling a modern Indian inkpot, *dowāt*. *Ht.* 32 mm. Grey ware with sepia slip. Rough flat base. Pl. XIX, 6.

*Type 18*—

259. *B 33* shallow saucer with rounded brim. Underside shows marks of dressing by some toothed implement. Pale red ware with white slip. Inside in sepia, D 45, surrounded by ring of swags and lines. *Ht.* 37mm. *dia.* 128 mm. Pl. XIX, 7.

*Type 19*—

260. *B 34* squat goblet with small foot. *Ht.* 81mm. Red ware with greyish black, metallic looking slip. Pl. XIX, 8.

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[1] Only single specimens of Types 15-30 were recovered.

*List of pottery recovered at Nāl*—concld.

*Type 20*—

261. *E 27* open bowl with curved sides and flat bottom. Very fine red ware of exceeding lightness. Thin walls. White slip. Ornament in sepia lines and D 3. *Ht.* 56mm. Pl. XIX, 9.

*Type 21*—

262. *E 43.* Open bowl resembling Type 1 (*a*) but having solid foot instead of ring base. Top edge straight and ornamented with D 51, the outline in black, the upper triangles red, the lower yellow. Pale greenish ware. *Ht.* 65 mm. On under side marks of tool used to dress the clay after turning. Pl. XIX, 10.

*Type 22*—

263. *E 49* Straight sided vessel resembling Type 6 but without ring base or foot. *Ht.* 53 mm. Fine red ware with thin walls. White slip partially preserved. Ornamented with sepia lines. Pl. XIX, 16.

*Type 23*—

264. *E 62* Globular vessel with wide mouth and everted brim. Small flat base. *Ht.* 92 mm. Fine red ware. White slip. Ornament in sepia of parallel lines and D 2. Pl. XIX, 12.

*Type 24*—

265. *RF 1* Vase with narrow mouth and small solid foot. *Ht.* 137 mm. Greyish ware with dark red slip. Ornament in black of lines, broken line, D 50, and D 23 repeated thrice. Heavy fabric, from Room F. Pl. XIX, 13.

*Type 25*—

266. *RF 2* Broken vessel with swelling side and heavy foot. Missing top probably resembled the foot but with slightly recurving brim. *Ht.* 44 mm. Greyish green ware, undecorated. Room F. Pl. XIX, 14.

*Type 26*—

267. *TG 3* Squat vessel with open mouth resembling Type 11 but having small vertical brim. *Ht.* 41 mm. Buff ware fired to red on one side. Ornament in sepia on white slip, D 50 between two parallel lines. Pl. XIX, 15.

*Type 27*—

268. *R 5, 8* Vessel with open mouth resembling Type 20 but having ring base. *Ht.* 89. Red ware, buff slip. Ornament in sepia, lines and D 11 repeated thrice. Pl. XIX, 11.

*Type 28*—

269. *E 60* Large open bowl with broad foot. *Ht.* 161 mm. Pale grey rough biscuit-like ware. No slip. Undecorated bowls of this type usually contained several small vessels and sometimes bones. Pl. XIX, 17.

*Type 29*—

270. *E 61* Small funnel. *Ht.* 45 mm. Red ware. White slip exterior. Three sepia lines exterior and interior. Pl. XIX, 18.

*Type 30*—

271. *B 25* Large open bowl resembling somewhat Type 28, but having more prominent sides. *Ht.* 160 mm. Grey ware but red on base and one side. Carefully modelled raised undulating band round greatest diameter. Pl. XIX, 19.

## APPENDIX V.

### *Report on the bones excavated at Nal.*

BY

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AND

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Up to the present time the collection of prehistoric human remains in India appears to have been somewhat neglected and the importance and interest of the study of such remains has been overlooked. The present collection of human remains was excavated at Nal in Baluchistan by Mr. H. Hargreaves of the Archæological Survey of India and is attributed by Sir John Marshall to the Chalcolithic-age. Human remains attributed to a similar age or a little later have from time to time been excavated in different parts of India, but we still know little of the habits and customs that existed among these early, yet, so far as we can judge, comparatively highly civilized people. No accounts of any of the human remains, that have been discovered during archæological excavations in India, have hitherto been published and in most cases the collections themselves have disappeared or were regarded as of no consequence and were not preserved [1] and with the exception of a single paper by Sir Arthur Keith [2] on two crania, and a few notes by Lapicque [3] and Thurston [4] on prehistoric skulls in the Madras Museum, we are completely ignorant of the physical characters of these early peoples and wherein they resemble or differ from races inhabiting other countries at the same period of history. Keith's paper is of particular interest in the present connection, for of the two crania described by him one, known as the "Sialkot" cranium, appears in all probability to belong to much the same period as the present collection. Although there is no definite evidence regarding the age of this skull, its general condition—"very similar in consistency to human remains recorded from burials of a bronze-age or later date in England"—would suggest that it is more or less contemporaneous with the Chalcolithic-age in India. The second or "Bayana" cranium seems to be considerably older. It was discovered by Mr. Wolf in 1912 on the bank of the Gumbhir River at Bayana near Agra, 35 feet below the level of the bed of the river, while building a bridge on the Bayana-Agra Railway. In the absence of precise data of the constitution of the alluvial deposit in which the skull was lying no definite date can be assigned to it, but the great depth at which the skull was found, as well as its mineralization, leaves no doubt that it is of considerable antiquity and is possibly the oldest human skull so far found in India.

Our knowledge of the physical characters of the primitive inhabitants of India is thus still in its infancy; but extensive reports have been published of excavations in and round Central

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[1] Report on Tours in the Central Doab and Gorakpur. *Archæological Survey of India*, Vol. XII, pp. 79-80, 1876, Calcutta.

[2] Keith, *Journal of the Anthropological Society of Bombay*, Vol. XI, No. 6, pp. 663-72, 1917, Bombay.

[3] M. Louis Lapicque, Note Sommarie sur une mission ethnologique dans le Sud de l'Inde : la race noire Predravidienne, *Mus. d'Histoire Naturelle*, pp. 283-85 1905, Paris.

[4] E. Thurston, Castes and Tribes of Southern India, Vol. I, pp. xxvi-xxvii, 1909, Madras.

Asia, Mesopotamia, Europe and in Egypt, and these have rendered available a mass of valuable information regarding the characteristics, both physical and cultural, that distinguish the races which inhabited these countries in times more or less contemporary with the Nal civilization. Such reports provide a basis of comparison, and, unless the facts directly contraindicate it, we are, we think, justified in assuming that a similarity between these human remains in India and those of other regions is evidence of a racial identity in spite of the great distances that may separate the countries.

A study of human remains and of the objects found in association with them excavated in both Europe, Asia and Northern Africa, and attributed by competent authorities to the same, or at any rate to a similar, stage of civilization, namely the Copper or Bronze age, reveals a remarkable degree of similarity in many of the customs and habits that appear to have prevailed. The type of pottery and implements, and the mode of interment of the dead are in many cases remarkably similar, if not actually identical, and it is, therefore, of particular interest to see to what extent the present collection agrees or differs from contemporary remains in other countries and to try and deduce from the materials before us not only the habits and customs that were in vogue at this stage in Indian history, but also to trace the relationships or differences, both physical and cultural, between this early race and the contemporary inhabitants of neighbouring regions; but, in the absence of any previous studies of this nature in India, many of our conclusions must remain purely conjectural.

The collection of human remains, on which the following report is based, is but a small one and consists of the fragmentary remains of thirteen individuals, seven only of whom are adults and of these only a single skull has been sent to us. The collection includes fifteen parcels of bones. Of these No. 1 consists of this single adult skull from a burial group. Associated with the skull was found a collection of six vessels, some of which contained a few bones, both human and mammalian. No. 2 consists of a single human tooth. Parcels Nos. 3, 4, 5 and 7 consist of small bones or fragments of larger bones, and these were all recovered from earthen vessels. Nos. 9, 11 and 12 are from graves, each of which contained the remains of one infant. Nos. 14 and 15 appear to be the remains of burial groups, in which are included both adults and children; and mixed with these human remains are bones of both birds and mammals. A complete catalogue of the osteological finds is given at the end of this paper in an appendix. Among the bones sent to us were several artifacts, some of which were broken fragments of pottery, but two were of bone. It is interesting to note that bone implements or ornaments appear to be of comparatively rare occurrence, at any rate in certain Asiatic regions (*vide infra*), in excavations belonging to the Chalcolithic or Copper-age, and the present collection would seem to be no exception to this. One of the bone artifacts is a broken flat plate that shows evidence of having been incised, while the other, which is in a fragmentary condition, is of the nature of a bone pin. The bone pin is of some interest. The complete pin was approximately some 10-12 inches in length, but it was broken into several fragments, and portions were missing: the broad end measures 14 mm. across, and the ornament tapers slowly to a point. It has been highly polished and the margins are bevelled off. The ornament was undoubtedly manufactured from the rib of a large mammal, probably an ox, the bone being split lengthwise; and in the present instance the compact bone of the inner surface was used. A rough pin of an exactly similar type was made for the purpose of comparison by first sawing out a tapering portion of an ox rib and then splitting the two lamellæ of the inner and outer aspects apart. Each portion could then be polished and smoothed and in this way two pins would be made, having, of course, opposite curvatures. During the excavations at Anau by the Expedition sent out by the Carnegie

Institute to Turkestan in 1904 [1] a few bone implements were found but objects made of this material were rare. Schmidt,[2] describing the excavations, remarks that in both the North and South Kurgans bone objects were rare, but in the North Kurgan fragments of two polished implements, probably made from the ribs of an animal, were found, and a bone pin was also found at Ghiaur Kala (old Merv). It would appear, therefore, that in times more or less contemporary with the Nal remains the custom of manufacturing ornamental or other articles from the ribs of large mammals was wide-spread, though, possibly, not of common occurrence.

In collections Nos. 14 and 15 at Nal the close association of adult, adolescent and infant remains suggests the possibility that each represents a family, but it is equally possible that among these early races a custom may have prevailed similar to that which persists among the Udayas and Irulas of the Madras Presidency at the present day, who " prefer to use a grave in which a previous burial has taken place ".[3] Collections Nos. 9, 11 and 12 each contain the remains of an infant ; in each case all parts of the body are represented in the collections so that it seems clear that the body was buried *in toto*. In the case of the adult remains, on the other hand, the number of bones per individual is comparatively small and, whereas in collections 14 and 15 these come from burial groups, in No. 10 they are from a large pot. The paucity of remains of the adults suggests that the treatment of such corpses was different from that of the children, and the different treatment of the bodies of adults and children is a wide-spread practice throughout India at the present time. In certain instances the exhumation of the adult corpse and its reburial is known to occur, as in the case of the Southern Nicobarese [4] and it seems possible that in the present case adult remains may, after the initial burial of the corpse, have been subsequently exhumed and reinterred, whereas infants were buried once and for all. It is, however, more probable that the custom followed in this region was identical with that which has been shown by Mockler [5] to have persisted among the ancient inhabitants of Makran in Baluchistan. In their case, he writes, the mode of interment appears to have been that " the bones of the deceased were probably collected after the body had been exposed to the elements and attacks of carnivora for a certain time, and then placed, occasionally in an earthen pot but more generally loose, on the floor of the '*damb*' or grave ". The custom of exposing corpses to wild animals or birds appears to have been an ancient one in this region, for, as Buller [6] points out, the early classical authors record that " when Alexander crossed the Arabius and entered the country of the Oritæ or Horitæ (a people whom it may be possible some day to identify with the Horu clan of the Miragi Mengals living in the Saruna valley) he found that they did not bury their dead, but threw them to the wild beasts ".

It is, however, by no means certain that the bones contained in the various pots at Nal were intentionally placed there. While this may have been done in the case of No. 10, as regards the others it appears more probable that these vessels originally contained articles of food, etc., and were placed, as part of the burial rites, by the side of the corpse ; the presence of bones in the vessels may thus be due to their accidental introduction, and the presence in these pots in addition to human remains, sometimes of a very scanty character, of the bones of other animals, presumably domestic, as mentioned below, and in several instances of artifacts, one at least of

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[1] Explorations in Turkestan, edited by R. Pumpelly, Vols. I and II, 1908, Washington, D. C.

[2] Explorations in Turkestan, edited by R. Pumpelly, Vol. I, Part II, pp. 163-64 and 201, 1908, Washington, D. C.

[3] E. Thurston, Castes and Tribes of Southern India, Vol. II, p. 121, 1909, Madras.

[4] Sir James Frazer, The Golden Bough, Part III. " The Dying God," p. 96, 1911, London.

[5] Major Mockler, On the Ruins in Makran. *Journal of the Royal Asiatic Society of Great Britain and Ireland*, n. s., Vol. 9, pp. 121-134, 1877, London.

[6] " Gabrbands in Baluchistan", *Archæological Survey of India, Annual Report*, 1903-04, p. 201, 1905, Calcutta.

which is of the nature of an ornament, while others are fragments of broken pottery, lend support to this conclusion, and this is still further borne out by the information, supplied by Mr. Hargreaves, that " a piece of a skull was found between two of the pots ". It can hardly be supposed that, if the human remains were collected and buried in pots, such other objects would be deliberately buried with them; whereas if the pots were buried along with the corpse in a common burial ground, as appears in certain instances to have been the custom among these early people, the subsequent subsidence of the supernatant soil into the pots would naturally be accompanied by fragments of human bones and other extraneous articles, such as refuse and broken pottery.

It is interesting to note that mixed with the human bones in the collections that contained the remains of adults were bones belonging to other animals, *viz.*, a bird and at least two mammals.

Unfortunately the number of mammalian and avian bones present is too small to enable one to identify the species that they represent; but of the mammals one was of the size of an ox and the other approximately of the size of a small Gazelle or Musk Deer. As regards the latter bones, several of them indicate that the original animal from which they came was immature, and it is probable that the adult would have been rather larger, possibly about the size of a sheep. It is impossible to say whether these remains belong to wild or to domestic animals. If the latter, then it would appear likely that these early people possessed flocks and herds of cattle, sheep and goats and possibly fowls, in which case the admixture of these bones with those of human beings is probably accidental and due merely to a lack of system in the disposal of refuse—a common condition in Indian villages at the present day. Among the ancient remains in Southern India [1] that appear to have belonged to a period that is probably subsequent to the copper or bronze-age, representations of certain domestic animals, namely the buffalo, goat or sheep and the cock, have been discovered in bronze and at Mohenjo-daro and Harappa in the Indus Valley pottery figures of the humped cattle, of the buffalo and of a horned sheep, as well as of poultry, are of common occurrence and it seems probable that the remains of animals, other than human, occurring in the present collection are equally those of domestic animals. On the other hand if the bones were those of wild animals, such as the wild ox or Gazelle, it may have been that in early times the same custom obtained then as is found to-day in Baluchistan. Tate[2] records that " a Baluch or Afghan Graveyard or Ziarat is usually a very good guide as to the game that exists in the neighbourhood. Trophies of the chase are usual *ex-voto* offerings at these places, and are plentiful when game abound " and if a similar custom prevailed in these early times the presence of bones belonging to mammals, such as the wild ox or Gazelle, may be thus accounted for.

It seems probable that the burial customs at Nal and Anau were somewhat similar, if not actually identical. As Dr. Pumpelly [3] points out in his account of the excavations of the North Kurgan at Anau, neither of the two adults, remains of whom were unearthed, appears to have been formally buried. In the South Kurgan one adult was discovered, who appears, so far as can be judged from the few remains that had escaped destruction, to have been buried *in toto*. This latter skeleton possessed a skull that is said to have been markedly dolichocephalic, but no account of it appears ever to have been published. The body appears to have been interred in the same embryonic position as was universally the custom in the interment of children at

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[1] Rea, A, Prehistoric Antiquities in Tinnevelly. *Archæological Survey of India, Annual Report*, 1902-03, p. 117, 1904, Calcutta.

[2] Tate, G. P., The Frontiers of Baluchistan, p. 22, 1909, London.

[3] Explorations in Turkestan, edited by R. Pumpelly, Vol. I, pp. 68-69, 1908, Washington, D. C.

Anau. Unfortunately we have but little data regarding the position in which the children at Nal had been buried. The wide-spread adoption of the embryonic position in these early times is shown by the remains that have been excavated at Anau, in Egypt, around the shores of the Mediterranean Sea, in Palestine and in the Caucasus region ; and this custom prevailed from Neolithic times to the Copper or Bronze-age, so that one might reasonably have expected to find that it was the custom at Nal also. Mr. Hargreaves, who superintended the excavation of the remains, informs us, however, that in most instances the remains were incomplete and, in consequence, any deduction regarding the original position of the body was impossible. In one instance they unearthed at Nal a complete burial [1] and in this case the body, that was of an adult, appears to have been in a position that is, at the least, an approximation to the crouched attitude as is shown in the photograph, the hands being placed in front of the face and the knees drawn up and the legs flexed. More recently other burials in which the body had been placed in the embryonic position have been discovered at Mohenjo-daro in Sind though these are almost certainly of a more recent date. Mr. R. D. Banerjee, of the Archæological Survey of India, informs us that the skeleton which was excavated by him at Mohenjo-daro and which appears to have been contemporary with Mohenjo-daro civilization but which unfortunately has been lost, was placed on the left side, though the photograph of the burial indicates that it was not in the crouched attitude but was fully extended.

We take this opportunity of thanking Sir John Marshall, Director-General of Archæology in India, and Mr. Hargreaves for kindly giving us the opportunity of examining these most interesting remains.

*General Condition of the Bones.*

The bones in the collection are all extremely fragile and much inclined to crumble ; none show any sign of having been burnt. As regards their general character, they appear to agree very closely with the "Sialkot" cranium which was discovered by Capt. Hingston, I.M.S., in 1912 and was described by Sir Arthur Keith. Describing this and the "Bayana" cranium, Keith [2] remarks "the bones are of a chalky grey colour, inclined to crumble and very similar in consistency to human remains recovered from burials of a Bronze-age or later date in England". The bones in the present series are of a pale fawn colour and have undergone very considerable post-mortem changes. As one would expect, the whole of the organic matrix has completely disappeared but not the slightest trace of any commencement of fossilization is to be found. In addition, Mr. G. H. Tipper, of the Geological Survey of India, who has kindly examined a fragment of bone, informs us that a considerable chemical change has taken place in the mineral constituents; calcium phosphate has almost entirely disappeared and has been replaced by calcium carbonate, while in certain specimens it is found that a considerable deposition of gypsum (calcium sulphate) has occurred. Probably this change is largely due to the nature of the soil in which the bones had been buried. The deposition of gypsum is found to be limited almost entirely to the medullary cavities of the long bones or to areas, such as the ends of long bones or the thicker portions of the os innominatum, where there is a considerable amount of cancellous formation; and it would, therefore, appear to be associated with areas of high vascularity and the presence, during life, of a copious blood supply.

In consequence of their extremely friable and fragile nature many of the bones have broken during the process of excavation as is shown by the freshly fractured ends. In several instances

[1] Sir John Marshall, Sind's Prehistoric Civilisation. *The Times of India* Illustrated Weekly, pp. 30-31, March 7, 1926, Bombay.

[2] Keith, *Journal of the Anthropological Society of Bombay*, Vol. IX, No. 6, p. 664, 1917, Bombay.

at the fractured ends the bones are seen to have been stained a faint pink colour, possibly due to the presence of iron in the soil. It is unfortunate that not a single long bone, such as the femur or humerus, is intact, as one has, therefore, no clue to the general stature of the race, which these remains represent.

*The Skull.*

The skull had been coated, in order to preserve it during exhumation and transit, with a thick layer of wax which had solidified on and around the bones and over the earth with which the cranial cavity, the orbit, etc., were filled, but had not penetrated into the substance of the bone; in consequence very great difficulty was experienced in removing this wax without irreparably damaging the extremely fragile bones of the face and the cranium, especially the more delicate ones. After its removal, the bones were treated with a solution of shellac in alcohol, which penetrated into the bony substance and on evaporation of the alcohol set into a solid mass, allowing the skull to be freely handled and measured.

Mixed with the earth were a few small pebbles of limestone, all, with the exception of a single stone noted below, of small size usually not larger than that of a pea or even smaller, and Masson [1] states that it was the custom in Afghanistan in past times to bring the earth, in which human remains were buried, from the valleys up to the more hilly and stony areas and that this earth was carefully sifted in order to remove the stones. The first interesting feature that came to light during the process of cleaning was a flat stone, also of limestone, that is roughly crescentic in outline and measures 32 mm. in its long axis by 16 mm. transversely. The larger portion of the stone is flat on each side but at the narrow end there is a raised rounded boss on one side (*vide* Pl. XXIV, fig. 1). The general appearance of the stone suggests that it is an artifact and that it has been roughly ground down on the two sides, leaving a small rounded boss at the narrow end. The stone was situated immediately at the back of the hard palate below the base of the cranium and opposite to and to a large extent occluding the posterior nares (*vide* Plate XXII, fig. 5). Its major axis lay transversely and its minor axis was vertical as regards the skull, so that viewing the skull from below (norma basilaris) one sees only the edge of the stone.

The position of the stone and its general character suggest the possibility that it was deliberately placed in this position either during or shortly after death. We have been unable to find in the literature any reference of such a custom, *i.e.*, of placing objects in the mouth of a corpse, among prehistoric races. In India at the present day, however, the custom of placing certain articles in the mouth, either immediately prior to or after death, persists in various regions and among certain tribes and castes. Thurston [2] records that among Badagas of the Nilgiri Hills, "when death is drawing near a gold coin, called *Viravaya haro* or 'fanam', dipped in butter or ghee, is given to the dying man to swallow" and he remarks that the giving of the coin to the dying man is apparently an important item in the death ceremony of this race. A similar custom prevails among the Nayars of Malabar where a similar small gold coin (a 'Rasi fanam', if one can be procured) is placed in the mouth of an individual when dying, if the relatives are rich enough to afford it. Similarly, at the present day a rather more elaborate custom persists among certain Hindus in Bengal of placing five different articles in the mouth of a corpse prior to cremation, *viz.*, gold, silver, diamond, pearl and coral. One hesitates to put forward any suggestion on such scanty grounds, but it seems possible that the introduction of a stone in

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[1] Masson, Charles, "Journeys in Baluchistan, Afghanistan and the Punjab," Vol. II, p. 253, and Vol. III, p. 159, 1842, London.

[2] E. Thurston, Ethnographic Notes in S. India, p. 189, 1906, Madras.

the mouth of a corpse of the Chalcolithic or copper-age may have been the precursor of the more elaborate custom persisting at the present day in parts of India, and it is interesting to note that the higher caste Hindus of Bengal and the Nayars of Malabar are, probably, both racial descendants of the "Caspian-Mediterranean stock" that migrated in or before the Chalcolithic period into the North-Western Provinces and the Indus Valley. On the other hand it is possible that among these early races there existed a superstition and custom similar to that which existed in ancient Japan and still persists in certain regions of South America. In the Neolithic sites at Ko in the province of Kawache in the western part of Nippon and Miyato Island large round stones were placed on the thoracic region of the dead to prevent the escape of the spirit so that it could not cause evil to men.[1] "The Itonamas[2] in South America seal up the eyes, nose and mouth of a dying person, in case his ghost should get out and carry off others; and for a similar reason the people of Nias, who fear the spirits of the recently deceased, and identify them with the breath, seek to confine the vagrant soul in its earthly tabernacle by bunging up the nose and tying up the jaws of the corpse." A similar belief in the escape of the soul through the apertures of the body exists in India at the present time. Sir H. Risley has shown that in Bengal the Bauri[3] caste bury their corpses "face downwards, the object of this attitude being to prevent the spirit from getting out and giving trouble to the living". A similar custom, and for a similar reason, exists among the Koras[4] and Kurmis[5] of Chota Nagpur and Orissa and is specially employed in the case of people who have died by a comparatively sudden or violent death. The Domes,[6] the Mahilis[7] of North Manbhum and the Dhotas[8] of Orissa bury the body face downwards in the case of young children and those who have died by cholera or small-pox, and the same custom in regard to children under 5 years of age exists among the sweeper castes of Upper India. This custom also appears to have prevailed among the Sansi Gypsies of the Punjab, for Ibbetson[9] remarks, "In old days the Sansi, wherever he might die, was taken to the burying (? burning) ground of the tribe in the neighbourhood of Ajmer; but they now burn adults and bury children on the spot, the corpse in both cases being placed face downwards", probably for the same reason, namely to prevent the escape of the spirit. The belief in the escape of the soul through the mouth is clearly wide-spread throughout India and is probably, therefore, of some considerable antiquity, and it may be that the introduction of a stone or soil in which the stone, if it is not an artifact, was embedded, was a burial custom among the inhabitants of Baluchistan in the Chalcolithic period and was either of universal application or possibly was limited to those who died a violent death, as appears to have been the case in the present instance.

The bones of the skull, like the other bones in the collection, are extremely friable and a large portion of the left side, including portions of both the cranial vault and the outer wall of the left orbit, is unfortunately missing. The lower jaw is also absent. The skull is markedly dolichocephalic, the length-breadth index being as low as 70·0. It is impossible to conclude from a single example that this was characteristic of the race, since as Wright[10] points out, "even in

[1] H. Matsumoto, Notes on the Stone Age People of Japan. *American Anthropologist*, p. 65, 1921.

[2] I. G. Frazer, The Golden Bough, Part II. Taboo and the Perils of the Soul, p. 31, 1911, London.

[3] Sir H. Risley, Tribes and Castes of Bengal, Vol. I, p. 81, 1891, Calcutta.

[4] *Ibid*, p. 510.

[5] *Ibid*, p. 535.

[6] *Ibid*, p. 248.

[7] *Ibid*, Vol. II, p. 42.

[8] *Ibid*, p. 231.

[9] D. C. J. Ibbetson, *Report on the Census of the Punjab for* 1881, Vol. I, p. 154, 1883, Calcutta.

[10] William Wright, Skulls from the Round Barrows of East Yorkshire. *Journ. Anat. and Phys.*, Vol. XXXVIII, p. 119, 1904, London.

times so remote as the early Bronze-age, there was a very marked diversity in skull shapes, even in those taken from the same area ". Soren Hansen [1] has called attention to the fact that fossil skulls are usually found lying on their side, and he remarks " the cephalic index of fossil human skulls is in itself of very slight importance, because it is in a great degree affected by the post-humous deformation due to the pressure of the earthen mass which has covered the skulls in graves and other places of interment ". A result of this pressure will be to cause a lessening of the breadth and a corresponding increase in the length, which, though possibly slight in itself, may, when combined as in the Cephalic Index, produce an appreciable degree of diminution in the calculated figure. Wright [2] in describing certain early crania of the Bronze-age from round Barrows in Yorkshire, points out that in several of the skulls the left side of the face is wanting although the right side may be excellently preserved. The reason he assigns for this is that in these cases interment was carried out with the body lying on the left side. He remarks " it being almost invariably the case with these skulls that the side upon which they lay is fragmentary, probably due to the fact that the undisturbed earth retains the moisture more than that which fills-in the grave ". The similarity in the condition of the present skull with that of the skulls of the Bronze-age in England indicates the possibility that in this case also interment was made with the skull lying on the left side and possibly this may have been the racial habit. One hesitates to draw any conclusion from a single example, for a similar condition of the skull might be due merely to its having lain on its left side and have no bearing on the mode of interment, and it is probable that this is the true explanation. As a result, probably, of the post-mortem disintegration of the bones of the left side of the cranium, the skull has undergone a slight deformation, which is best visible when it is viewed from in front, the upper and posterior portions of the cranium having a slight, though distinct, tendency to be bent over to the left.

In the right temporo-sphenoidal region is a depressed comminuted fracture involving the squamous plate of the temporal bone, the postero-inferior area of the frontal and the antero-inferior area of the parietal bones. In and around the fractured area the edges of the bones are stained a pink colour and beneath the fractured area is a deposit of gypsum. Similar localised deposits of gypsum occur at the anterior and inner end of the temporal fossa, on the outer wall of the orbit and in the upper part of the left nasal cavity. The only other places in which extensive gypsum deposits occur are, as has been mentioned above, in the medullary cavities of some of the long bones and in the cancellous areas of the os innominatum. This suggests the possibility of the deposit being due to the interaction of the calcareous salts of the bone or of the surrounding soil with the decomposition products of organic matter in vascular areas or in areas of extravasated blood. If so, then it is not improbable that this depressed fracture was the cause of death and was accompanied by hæmorrhage at the site of the injury and, as one would expect in a fracture of the skull, into the orbital and nasal cavities. In the occipital region, slightly to the right of the middle line, the bone has been fractured and a small portion forced outwards, possibly a secondary effect, or " *contre coup,*" of the original injury.

As the whole cranial cavity is filled with a solid deposit of earth, which in view of the friable nature of the bones we have thought best to leave *in situ*, it is difficult to arrive at any definite conclusion regarding the thickness of the cranial vault. In the lateral frontal areas, where a portion of the bone is free, the thickness is 7·0 mm. In the " Sialkot " cranium, which we have been able to examine through the courtesy of the Bombay Anthropological Society, in the

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[1] S Hansen, " On Posthumous Deformation of Fossil Human Skulls". *Man*, Vol. XIX, No. 65, p. 121, 1919.

[2] William Wright, Skulls from the Round Barrows of East Yorkshire. *Journ. Anat. and Phys.*, Vol. XXXVIII, p. 120, 1904, London.

corresponding position the thickness of the vault is only 6·0 mm.; this may be due to a difference of sex, the "Sialkot" skull, in our opinion, belonging to a female, whereas the "Nal" cranium is in all probability that of a male.

*General Characters of the Sutures.*

The Coronal suture in the pars bregmatica is simple and in the more lateral region, in the pars complicata, is only slightly convoluted. The Sagittal suture is also simple in the pars bregmatica, but it becomes increasingly complicated as one traces it backwards (*vide* Plate XXII, fig. 2). The Lambdoid suture is still more complicated on the right side of the skull, but on the left side it is comparatively simple. At the Lambda itself two large Wormian bones are present, lying one behind the other in the median line; the superior bone is the larger and measures 14 mm. by 31 mm., the inferior measuring 11 mm. by 25 mm. A third Wormian bone in the vicinity of the left Asterion measures 22 mm. by 18 mm. From the general characters of the sutures it is possible to arrive at an approximate estimate of the age of the individual, to whom the skull belonged. In the coronal suture there is no trace of commencing synostosis either at the pars bregmatica or pars complicata. The condition of the pars pterica cannot be determined, owing to this portion of the cranium being absent on the left side and badly fractured on the right. In the sagittal suture synostosis has not started either at the pars obelica, pars lambdica, pars verticis or the pars bregmatica. Similarly, in the lambdoid suture there are no traces of synostosis having commenced in any region, nor is there any synostosis of the circum-meatal sutures, so far as can be judged from the broken condition of the skull. Evidently, therefore, "the period of election" of the closure of ecto-cranial sutures had not yet commenced. Judging from this fact, the age of the individual to whom the skull belonged should be less than twenty-six years, provided that the skull is not an ab-modal one. It must, however, be remembered that the data given by Todd and Lyon [1] regarding the times of closure of these sutures were obtained from examination of the skulls of males of the modern White and Negro stocks and may, therefore, be somewhat different from those of a more ancient race. It is interesting to note that the general condition of the sutures of the "Sialkot" skull clearly shows that it belongs to a much older individual, for synostosis is almost complete along the sagittal suture and in part of the lambdoid suture.

*The Cranial Capacity.*

The Cranial capacity of the "Nal" cranium, owing to the defective left side of the skull, has had to be calculated from the measurements taken on the parts that are still preserved. Our calculations can only be regarded as approximate, for, as we have already mentioned, the skull has undergone a certain amount of post-mortem deformation, which may to some extent have altered the length and breadth measurements; furthermore, we must point out that the measurements, and indices depending on such measurements, of the transverse diameters of both face and cranium can only be regarded as approximate, since, owing to the damaged condition, such measurements have had to be calculated from the right half. For the purpose of calculating the cranial capacity we have used formula No. 10, given by Lee and Pearson.[2] The capacity thus calculated is 1449 ccs., which compares very favourably with the capacity of

[1] T. Wingate Todd and D. W. Lyon, Cranial Suture Closure—its progress and age relationship. *American Journal of Physical Anthropology*, Vol. VIII, No. 1, pp. 23-73, Washington, D. C., 1925.

[2] Alice Lee and Karl Pearson, A First Study of the Correlation of the Human Skull. *Philosophical Transactions*, Series A, Vol. 196, p. 247, 1901, London.

the skulls of modern European males. As the greatest breadth measurement has had to be calculated from the measurement of one half, namely the right side of the skull, the left side being damaged, we have thought it advisable to check the result obtained by the Lee-Pearson formula by some other method and for this purpose we have utilized the formulæ given by Wingate Todd [1] for calculating the capacity from a single measurement. Utilizing his formulæ Nos. 1 and 3 for Male whites we get the following results :—

1. Cubic capacity $=6{\cdot}59\times$Total length $+195{\cdot}44=1437{\cdot}7$.

2. „ „ $=14{\cdot}43\times$Auricular height$-288{\cdot}65=1442{\cdot}9$.

The average of all three estimates is 1443·2 ccs. Buxton [2] has recently called attention to the fact that the Lee-Pearson formula, when applied to Esquimo skulls does not yield very satisfactory results and from calculations based on data of 160 crania he has arrived at the formula :—

$$\text{Capacity}=0{\cdot}00049\ (\text{Length}\ \times\text{breadth}\times\text{auricular height})-37{\cdot}2.$$

Since the Nal skull is of a type that agrees in certain respects with the Esquimo, both having a high vault and a certain degree of scaphocephaly, we have also applied Buxton's formula to the present skull; this gives an estimated cranial capacity of 1474·9 ccs., which is but little different from that obtained from the Lee-Pearson and Wingate-Todd formulæ. It is interesting to note that the cranial capacity of the Sialkot skull, calculated by means of the two formulæ, is 1360 (Lee-Pearson formula) and 1318·3 (Buxton formula). The capacity, therefore, is somewhat less than of the Nal skull, but compares just as favourably with the cranial capacity of modern European women as the " Nal " skull does with the men. We are inclined to suspect, as already mentioned that the " Sialkot " skull is that of a woman, which would account for its rather smaller size, the absence of supraorbital ridges, and the lesser thickness of the bones. In this view we respectfully beg to differ from Sir Arthur Keith [3] who remarks " in both cases (*i.e.*, the " Sialkot " and " Bayana " crania) I infer they are male skulls".

### *Norma Occipitalis* (Plate XXII, Fig. 2).

In the Norma Occipitalis the skull appears pentagonal, and the maximum breadth is found at the parietal eminences from which points the lateral parietes converge towards the mastoid region. The external occipital protuberance is well developed and there is a marked transverse torus. There are two Wormian bones at the lambda and one near the left Asterion (*vide supra*, p. 64).

### *Norma Verticalis* (Plate XXII, Fig. 4).

The skull is markedly dolicho-cephalic, its cranial index being 70·0. This, however, may be slightly greater than the true figure for, as we have already remarked, there has been a certain degree of post-mortem deformation of the skull and further, possibly due to ante-mortem injury, the coronal suture has been forced slightly apart, to the extent of about 2 mm., so that the true length of the skull is probably somewhat less than that given in Table 2 below and this would to a slight extent increase the cephalic index and decrease the estimated cranial capacity. The frontal area is well rounded and the breadth uniformly increases to the Parietal eminences, which are well marked. The Occipital region is rounded and is slightly asymmetrical owing to the fracture noted above, in which a portion of the bone has been forced outwards. The general

[1] T. Wingate Todd, Mathematical Calculation of Cranial Capacity : *American Journal of Physical Anthropology*, Vol. VI, p. 138, 1923, Washington D. C.

[2] L. H. D. Buxton, On the Reconstruction of Cranial Capacity from External Measurements, " *Man* ", No. 97, p. 156, October, 1925.

[3] Sir Arthur Keith, *Journal of the Anthropological Society of Bombay*, Vol. XI, No. 6, p. 665, 1917, Bombay.

shape of the skull when viewed from this aspect is that of an elongate rhomboid, and corresponds closely to the type named by Sergi [1] "Pentagonoides acutus" [*cf.* Pl. XXII., fig. 4 and Sergi (*loc. cit.*) figs. 38, 48].

*Norma Lateralis* (Plate XXII, Fig. 1.)

The chief features of the skull in this view are the great height and uniformly rounded curvature of the vault This latter feature seems to be particularly characteristic, and it is also well shown in the "Sialkot" cranium. When viewed from the right side, as in Plate XXII, Fig. 1, the occiput appears to project sharply backwards: this, however, is due largely, if not entirely, to the fractured area, to which we have called attention above (*vide supra* p. 63), in which a fragment of the occipital bone has been forced outwards. As already mentioned, the skull is markedly dolichocephalic and this condition is in this view seen to be largely due to the very high degree of development of the Occipital region, as is shown by the position of the external auditory meatus, which is placed very far forwards. In this respect the "Nal" and "Sialkot" skulls agree closely. Keith [2] has called attention to this characteristic position of the meatus in certain Veddah crania. He remarks that in these skulls "the main growth of the brain is in an upward and backward direction, so that the ear passages appear to be further forwards—more central to the rest of the skull—than in crania of the Aryo-Dravidian type." In the "Sialkot" skull the position of the auricular aperture is distinctly further forward than in the Punjabi skull that he figures for comparison, and this feature is still more marked in the present skull owing to the increase in the cranial capacity and especially to its enlargement in the occipital region. For the purpose of comparison we have superposed the outlines, drawn to scale, of the lateral views of the present skull and of the "Sialkot" cranium (Plate XXIV, fig. 2) so that the central point of the external auditory meatus in each exactly coincides. The size of the Nal skull is larger than that of the "Sialkot" cranium but the two outlines of the vault and the occipital regions follow almost parallel curves and each presents those characters, which Keith has already noted in the "Sialkot" skull, namely that they are "distinctly higher in vault and somewhat more capacious than the small type of cranium" which Keith [2] selected for comparison, namely those of the "Punjabi" and of the "Veddah." The great height and uniformly-rounded curve of the vault has the effect of bringing the Bregma far forwards, so that the Bregma-index (*i.e.*, the distance from the Nasion to the point where a perpendicular dropped from the Bregma cuts the Nasion-inion line$\times$100 and divided by the Nasion-inion length) is remarkably small. In the "Nal" cranium this index is as low as 28·2 and in the "Sialkot" cranium appears to be only slightly, if at all, greater, whereas in the "Bayana" skull it is 33·6. In the "Sialkot" skull the facial area is entirely missing and we have, therefore, no standard of comparison as regards that part. In the "Nal" skull the supra-orbital ridges are well-developed and the glabella projects somewhat. The forehead at first rises almost vertically and then curves back to blend with the arch of the vault. The Nasion is not markedly depressed. The nasal bones themselves, except for small fragments at the root of the nose, are broken off short. The nasal spine of the Maxilla is also broken. The alveolar margin exhibits a certain degree of prognathism, due largely to a forward projection of the incisor and canine teeth; the alveolar profile angle is 79·5 so that the condition of the maxilla just falls within the limits of the prognathous group. The face, as a whole, however, is orthognathous, the facial angle (Frankfort) being 88°. The forward projection of the teeth and the consequent prognathism of the alveolar margin is possibly con-

[1] Sergi, "The Mediterranean Race," *Contemporary Science Series*, 1901, London.
[2] Keith, *Journal of the Anthropological Society of Bombay*, p. 671, 1917, Bombay.

nected with the hard nature of the food. An examination of the upper jaw, or such fragments of it as there are in the present collection, reveals no trace of prognathism in the newly-born or young child, so that it would seem that this condition develops late in life, a fact to which one of us (Sewell) [1] has called attention in the inhabitants of the Central group of the Nicobar Islands.

*Norma Facialis* (Plate XXII, Fig. 3).

The forehead is high and, as already mentioned, the supra-orbital ridges are well developed though not abnormally so. In the "Nal" skull the face is narrow in proportion to the length (hyper-leptic), the upper facial index being 60. The nose is also comparatively narrow, the nasal index, 46·9, just falling within the limits of the leptorrhine group. The inter-orbital breadth is only 20·0 mm.; this is in marked contrast with the measurement in individuals of the primitive races of Southern India, in whom this width is considerably greater, and agrees closely with the present day population of Baluchistan and the Punjab and even with the modern European. The orbit is high and the orbital index falls within the meso-conch group. On the left side there is a complete supra-orbital foramen, while on the right this is replaced by a well-marked notch. The zygoma is well developed but is not remarkably prominent; unfortunately the arch is incomplete on one side and totally absent on the other.

*Norma Basilaris* (Plate XXII, Fig. 5).

The basal length of the skull (Nasion-basion length) is 99·5 mm. The alveolar margin and the line of the teeth form a paraboloid curve, the two series markedly diverging posteriorly. The transverse palatine suture is of a somewhat unusual form; it passes at first forwards from the posterior palatal foramen and then turns inwards towards the middle line; before reaching this, however, it again bends forwards at a right-angle and then, bending sharply inwards again, crosses the middle line. The posterior margin of the bony palate forms a double curve, like an inverted 'W,' the central portion forming a well-marked rounded projection. In front of this projection the oral aspect of the palate is thickened and raised into a distinct ridge, which is narrow behind but widens out and finally is lost in front.

*The Teeth.*

Unfortunately all the incisor, canine and premolar teeth are missing. The molar teeth, of which three are present on the right side and two on the left, are large and well developed, as is seen from the dimensions given in the following table:—

TABLE 1.

*Dimensions of teeth.*

ON THE RIGHT SIDE.

| | |
|---|---|
| First Molar— | |
| Antero-posterior diameter | 11 mm. |
| Transverse diameter | 13 mm. |
| Second Molar— | |
| Antero-posterior diameter | 10 mm. |
| Transverse diameter | 11·5 mm. |
| Third Molar— | |
| Antero-posterior diameter | 9·5 mm. |
| Transverse diameter | 11 mm. |

[1] R. B. Seymour Sewell, "A Survey Season in the Nicobar Islands on the R. I. M. S. "Investigator." *Journal of the Bombay Natural History Society*, p. 972, 1922.

ON THE LEFT SIDE.

First Molar—

Anterior-posterior diameter . . . . . . . . 11·5 mm.
Transverse diameter . . . . . . . . . . . 13 mm.

Second Molar—

Antero-posterior diameter . . . . . . . . . 11·25 mm.
Transverse diameter . . . . . . . . . . . 12 mm.

An interesting feature of the teeth is the extent to which the biting surfaces have been worn. This wearing down of the teeth is of common occurrence in Neolithic man and persisted even into the Chalcolithic period. Sergi [1] has recorded its presence in the teeth of the race that inhabited Anau and Buxton [2] has also called attention to it in the skulls excavated at Kish. All the teeth in the present skull, as well as other isolated teeth in the collection, are very much worn. All trace of cusps has been destroyed and the biting surfaces are flat, indicating that the food of the people was of a hard nature. Among the cattle bones excavated at Anau [3] there are some (*e.g.*, ulna No. 13) which show "distinct traces of gnawing probably by human teeth". The extraordinary wearing down of teeth noted in the "Nal" skull may possible be due to a similar habit among the people of Baluchistan during the Chalcolithic age. In this connection Dr. S. C. Sen Gupta, D.D.S. (Penn) informs us that in his experience, extending over many years, he has found that at least 10 per cent. among the Indian people below 40 years of age, and a much larger number above that age, have their teeth worn down without showing any actual disease. This in his opinion may be attributed to the hard nature of their food, specially that which necessitates constant mechanical friction such as grains, pulses, etc. In some cases, however, as a result of metabolic disorder certain acids are produced which act as solvents for the enamel of the teeth and to this cause must be assigned the remarkable wearing down of teeth sometimes noticeable in quite young persons.

It is clear from the above measurements that the teeth of the "Nal" skull are remarkably large. Unfortunately no measurements of the teeth in either the Anau or the Kish skulls have been given so that we are unable to make any comparison. Hrdlička [4] has given a series of measurements of the teeth in different races of the present day and in Egyptians of the XIIth dynasty and it is interesting to compare these with the measurements of the "Nal" teeth. In the table below we have given the respective measurements in some of these races :—

| 1st Molar— | | American Indian. | Negro. | Egyptian XIIth Dynasty. | Whites U. S. | Nal Skull. |
|---|---|---|---|---|---|---|
| R. | Length | 11·41 | 11·20 | 10·61 | 10·60 | 11·00 |
| | Breadth | 11·13 | 10·95 | 10·39 | 10·51 | 13·00 |
| | Index | 97·5 | 97·8 | 97·9 | 99·2 | 118·2 |
| L. | Length | 11·43 | 11·10 | 10·63 | 10·50 | 11·50 |
| | Breadth | 11·17 | 10·85 | 10·42 | 10·52 | 13·00 |
| | Index | 97·7 | 97·7 | 98·0 | 100·1 | 111·0 |

[1] Sergi, Description of some skulls from the North Kurgan, Anau. Prehistoric Civilizations of Anau. Pumpelly, Vol. II, Pt. VII, p. 445, 1908, Washington D. C.

[2] Buxton, On the Human Remains excavated at Kish. Excavations at Kish, Vol. I, appendix, pp. 116-118, 1924, Paris.

[3] Duerst, "Animal Remains from the excavations at Anau". Prehistoric Civilizations of Anau, Pumpelly, Vol. II, pt. VI, p. 342, 1908, Washington D. C.

[4] Hrdlička, "Dimensions of the First and Second Lower Molars, etc." *American Journal of Physical Anthropology* Vol. VI, pp. 195-216, 1923, Washington D. C.

| | | American Indian. | Negro. | Egyptian XIIth Dynasty. | Whites U. S. | Nal Skull. |
|---|---|---|---|---|---|---|
| 2nd Molar— | | | | | | |
| R. | Length | 11·04 | 10·85 | 10·54 | 10·39 | 10·0 |
| | Breadth | 10·80 | 10·70 | 10·05 | 10·28 | 11·5 |
| | Index | 97·8 | 98·7 | 95·3 | 98·9 | 115·0 |
| L. | Length | 11·03 | 10·80 | 10·51 | 10·42 | 11·25 |
| | Breadth | 10·84 | 10·73 | 10·16 | 10·23 | 12·00 |
| | Index | 98·3 | 99·2 | 96·7 | 98·2 | 106·7 |
| | Average Index | 97·8 | 98·3 | 97·0 | 99·1 | 113·2 |

It is interesting to note that in the above table the Egyptians of the XIIth dynasty come, so far as the average length-breadth index of the teeth is concerned, at one extreme of the series, having an average index of 97·0, and the "Nal" skull at the other, with an average index of 113·2. The high index is in this latter case due to the extraordinary breadth of the molars, the average breadth for Molar 1 being 13·0 mm. and for Molar 2 11·75.

## TABLE 2.

*Measurements of the Skull.*

| | |
|---|---|
| Maximum Horizontal circumference | 528 mm.? (Calculated). |
| Maximum Cranial length | 188·5 mm. |
| Maximum Cranial breadth | 132 mm. ? (Calculated). |
| Basi-bregmatic height | 146 mm. |
| Auricular height | 120 mm. |
| Minimum frontal diameter | 93 mm. ? (Calculated). |
| Orbital breadth | 40 mm. |
| Orbital height | 33 mm. |
| Inter-orbital breadth | 20 mm. |
| Bizygomatic breadth | 120 mm. ? (Calculated). |
| Nasal Height | 49 mm. |
| Nasal width | 23 mm. |
| Intermalar breadth | 92 mm. ? (Calculated). |
| Basion-Nasion length | 99·5 mm. |
| Basion-Prosthion length | 90 mm. |
| Nasion-Prosthion length | 72 mm. |
| Ophryon-Prosthion length | 89·0 mm. |
| Palatal length | 53 mm. |
| Palatal breadth | 42 mm. |
| Length of alveolar arch | 59·5 mm. |
| Breadth of alveolar arch | 65 mm. |
| Length of Foramen magnum | 36 mm. |
| Breadth of Foramen magnum | 28 mm. |
| Length of Premolar and Molar Teeth | 43 mm. |

TABLE 3.

*Cranial Indices.*

| | |
|---|---|
| Cephalic index | 70·02 |
| Vertical index | 77·45 |
| Length-auricular height index | 63·66 |
| Breadth-height index | 110·6 |
| Index of foramen magnum | 77·78 |
| Facial index | 60·0 |
| Jugo-Malar index | 76·67 |
| Orbital index | 82·5 |
| Nasal index | 46·94 |
| Alveolar index | 90·45 |
| Palatal index | 79·25 |
| Palato-alveolar index | 109·24 |
| Bregma-Position index | 28·2 |
| Calculated cranial capacity | 1449 ccs. (Lee-Pearson) |
| ,, ,, ,, | 1475 ccs. (Buxton) |

TABLE 4.

*Facial angles.*

| | | |
|---|---|---|
| Frankfort | 88° | |
| Cuvier's | 90° | |
| Jacquart— | | |
| (*a*) to Glabella | 83° | Difference 2·5° |
| (*b*) to supra-orbital point | 80·5° | |
| Alveolar Profile Angle | 79·5 | |

*The Os Innominatum* (From collection. No. 14), Plate XXIII, Fig. 1.

The fragments were not sufficiently complete to enable one with certainty to determine the sex, but the smoothing of the inner part of the Ischio-pubic ramus would appear to indicate that it belonged to a female. Associated with the bones in the same earthen pot was the long curved bone pin that we have referred to above: such an object is of too brittle a character to have been anything but an ornament and it was in all probability a hair ornament, which would agree with the supposed female sex of the remains.

The main interest in the os innominatum lies in the shape and character of the acetabulum. Instead of having a nearly circular margin, the aperture is slightly pyriform, being extended upwards and forwards. At the apex of the major diameter the bony margin is smoothly rounded off, instead of, as is usual, being sharply marked. There is no indication in the bone of the occurrence of any disease, so that we may assume that the condition is a natural one. A very similar, though not quite so pronounced, smoothing of the upper and anterior margin of the acetabulum exists in certain innominate bones in the osteological collection of the Indian Museum, which presumably are those of Indians, though unfortunately no records of their origin can be traced. This change in the character of the acetabulum is possibly associated with the habit of squatting, which, as has been shown by Havelock Charles,[1] is in the Punjabi skeleton definitely

[1] Havelock Charles, The Influence of Function, as Exemplified in the morphology of the Lower Extremity of the Punjabi. *Journ. Anat. Phys.* (n. s.) Vol. XXVIII, No. 1, pp., 1-18, 1894, London.

associated with changes in the conformation of the articular surfaces of both femur and tibia. The cotyloid notch was well developed, but otherwise showed no abnormality.

*The Femur*. (Plate XXIII, Figs. 2 and 3).

The articular head of the femur, which is that of a youth aged 18 approximately, shows an extension of the articular surface on to the anterior and upper part of the neck exactly similar to or even better marked than that described by Havelock Charles [1] in the Punjabi. Meyer [2] has recently again called attention to this extension of the articular surface and has given a number of previous references to it, though he appears not to have known of Havelock Charles' paper. He points out that the presence of this facet, which he calls the " Iliac imprint ", adopting the term first suggested by Poirier in 1911, is of common occurrence, being found in about 70 per cent. of cases, and is as common in modern as in prehistoric skeletons. He attributes the formation of this facet to the habit of lying on the side, with the under limb flexed on the trunk.

The Pilaster of the femur is already highly developed although the age of the individual was, as mentioned above, only some 18 odd years. As Mollison [3] remarks, " it is natural that pilaster formation is found especially in such femora as have had the muscle-ridges well-developed, since in individuals having strong muscles greater demands are made on the femora, and individuals whose femora are brought severely into play have their muscles strongly developed ". In the present case it seems clear that full strength would not yet have been attained and that, therefore, in the adult the pilaster would be even more highly developed and the pilaster-index be still higher. The index in the present adolescent agrees exactly with that found in the Andamanese (Hepburn [4] gives it as 113·5). Mollison gives it as 121·4 in the copper-age remains from the North Kurgan (Anau) and this is probably more nearly the correct index in adults of the present series. The cross-section of the present femur taken slightly below the middle of the length of the diaphysis (*vide* Plate XXIV, fig. 3 (*b*)) agrees very closely with the sections given by Mollison [5] of the Anau femora examined by him ; both of his figures are of femora from the left side, whereas ours is from the right side of the body. The manner in which this cross section was taken by us is a modification of the technique employed by Mollison [6] and described by Fischer [7]. A plaster-of-paris mould of the bone was taken in a ring form at a level at which it was desired to take an optical cross-section. The mould was carefully removed in two halves and the two portions carefully adjusted and tied together. One side of the ring thus obtained was carefully ground down to the requisite level and was then placed on a sheet of photographic paper. The paper was then exposed to the light of an electric bulb held immediately above the open ring and the area affected by the light is thus an exact optical section of the bone at the level required.

A similar section taken at a distance of approximately 4·5 cm. below the lesser trochanter shows that this femur possesses a very high degree of Platymeria (Plate XXIV, fig. 3 (*a*)). The index of Platymeria taken at this level is $\frac{21 \times 100}{27 \cdot 25} = 77 \cdot 06$. In most of the text-books it is stated that the Platymeria-index should be taken immediately below the lesser trochanter. Manou-

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[1] Havelock Charles, The Influence of Function, etc., *Journ. Anat. Phys.* (N. S.) Vol. XXVIII, No. 1, p. 9, *et. seq.*, 1894, London.

[2] Meyer, " The Cervical fossa of Allen." *American Journal of Physical Anthropology*, Vol. VII, p. 257, 1924, Washington D. C.

[3] Mollison, *Exploration in Turkestan*, Vol. II, p. 452, 1908, Washington D. C.

[4] Hepburn, *Journ. Anat. & Phys.* Vol. XXXI, pp. 1 & 116, 1897, London.

[5] Mollison, *Explorations in Turkestan*, Vol. II, p. 452, fig. 493 (*a*) and (*b*) 1908, Washington D. C.

[6] Mollison, *Exploration, in Turkestan*, Vol. II, p. 452, 1908, Washington D. C.

[7] E. Fischer, *Zietschrift für Morphologie und Anthropologie*, Vol. IX, p. 184, 1906.

rier [1] himself, however, recommends that it be taken at the level where the antero-posterior diameter of the femur is smallest and this coincides in the present bone with the distance of 4·5 cm. below the lesser trochanter. Immediately below the lesser trochanter the index is considerably more than this, *viz.* $\frac{23 \times 100}{27 \cdot 00} = 85 \cdot 2$. As Duckworth [2] has pointed out Platymeria may be caused by (1) external widening as a flange-like process or (2) internal extension or (3) both forms of widening may produce the effect. In the present case the low index found at 4·5 cm. below the lesser trochanter is due almost entirely to the first of these causes. At this point the diaphysis exhibits a well-marked lateral extension, which is closely associated with the presence on the posterior aspect of the bone of a very highly developed *fossa hypo-trochanterica* (Plate XXIII fig. 3*b* and Plate XXIV, fig. 3*a*). Manouvrier attributes both conditions, *viz.*, platymeria and the presence of a fossa hypo-trochanterica, to the action of the quadriceps extensor cruris muscle in extending the body on the lower limb, and he maintains that this condition is due, along with the formation of platycnemia in the tibia, to life in mountainous regions. The optical section of the upper end of the diaphysis shows the existence of this fossa particularly clearly and it is evident that the outer margin of the fossa is also associated with an outward extension of the bone. It would seem therefore that the degree of platymeria present in this example falls into Duckworth's first category and may be due in the main to the increased action of the gluteus maximus muscle. Examination of the upper ends of a pair of femora in the present collection belonging to an infant of approximately one year of age clearly reveals that even at this early stage both fossa hypo-trochanterica and a commencing third trochanter may be present (Plate XXIII, fig. 3*c*). The situation of the fossa is interesting in these young bones since it lies almost entirely on the external aspect of the diaphysis and not on the posterior surface as in the adult. The presence of these structures at this age can hardly be attributed to the excessive use of the gluteus maximus muscle, as for instance in the act of climbing, since such children will hardly have learnt to walk, much less to climb mountain ranges. It would appear possible, therefore, that we have here a true racial character and not one acquired from habit in later life.

The change of position of the fossa hypo-trochanterica from the external margin to the posterior aspect appears undoubtedly to be due to unequal growth of the two surfaces of the bone, anterior and posterior, and the production of an external widening as a flange-like process, in the manner suggested by Duckworth, and is almost certainly due to the action of gluteus maximus muscle (compare Plate XXIV, fig. 3*a* and *d*). In the same infant's bones the formation of a pilaster has commenced (Plate XXIV, fig. 3*e*) and the bony ridge attains its maximum about the middle of the diaphysis. Here again the situation of the ridge is nearer the outer aspect of the bone than in the adult and apparently is pulled over, during subsequent development, towards the inner side of the posterior aspect and so finally attains its median position as age advances, probably as a result of the action of the vastus internus muscle.

### *The Tibia.*

No complete adult tibia was present in the collection but a portion of one indicates that a high degree of platycnemia was present. The cnemial index was 68·7; this corresponds very closely with the average index of 52 Punjabi tibiæ, which Havelock Charles [3] found to be 69·9, the extreme range varying from 61·1 to 90·4. In this connection it is interesting to compare the degree of platycnemia in the adult and in the children, whose remains formed part of

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[1] *Vide* W. L. H. Duckworth, Morphology and Anthropology, pp. 317-19, 1904, Cambridge.

[2] W. L. H. Duckworth, Morphology and Anthropology, p. 315, 1904, Cambridge.

[3] Havelock Charles, The Influence of Function as exemplified in the morphology of the Lower Extremity of the Punjabi. *Journ. Anat Phys.* (n. s.) Vol. XXVIII, No. 1, p. 13, 1894, London.

the collection (*vide* Plate XXIV, fig. 3*c* and *f*). The cnemial-index clearly varies with age and the condition of platycnemia is associated with adult characters rather than with those of childhood, since the degree to which it is present steadily increases as age advances. It would appear, therefore, to be an acquired character. In the smallest infant, judging from the size approximately newly born, the index is 87·5. In a slightly older child it is 84·2 and in a third infant of 6 months old it is already as low as 72·8.

The presence in the various remains of a change in the shape of the acetabular cavity, the gradual migration inwards of the pilaster and fossa hypo-trochanterica, as well as the decrease in the cnemial index from childhood to adult life, can be attributed to a single causative agent, namely increased muscular activity due either to the character of the locality in which these people lived or to the adoption of certain postures. As Havelock Charles has shown, all these changes can be detected in the Punjabi skeleton and he attributes them to the influence of altered strains and stresses on the bones and articulations caused by the adoption of the squatting posture. If this be the correct view, then the same explanation will account not only for the corresponding features found in the adult skeletons in the present collection, but also for the gradual decrease in the cnemial index from childhood to adult life, since the newly-born infants can clearly have, as yet, made no attempt to adopt this posture and the position *in utero* can hardly be associated with any great muscular activity.

### *The Os Calcis* (Plate XXIII, Fig. 4, *a* and *b*).

The os calcis exhibits one or two points of interest. The articulation for the cuboid, as in the skeletons excavated at Anau, is less visible when the bone is looked at from below than in the average European. The form of the joint surface is almost crescentic, being prolonged somewhat both at the outer and external part and below. The breadth-height index is 76·4, so that it falls between that given by Mollison for the Anau skeleton, *viz.*, 62·5 and that of the European calcaneum in which it is 92·0.

Another interesting feature is the forward prolongation of the anterior and lower portion of the tibial facet on to the floor of the fossa calcanei. Laidlaw [1] has called attention to the occasional forward extension of this facet in the os calcis of ancient Egyptians, belonging to the pre-dynastic Nagadah race and from the 5th dynasty to the Ptolemaic and Roman period. He does not, however, suggest any cause. One of us (Sewell[2]) has published an account of the Astragalus based on the same Egyptian collections, and in this it was shown that the corresponding facet, the *facies externa accessoria coporis tali,* is present in 10·15 per cent. of cases. "In almost all the bones in which this facet is present we find that the auricular facet (*facies malleolaris interna*) is prolonged forwards on the neck and in 20 per cent. of the cases a distinct internal facet was present on the upper surface of the neck." It is clear, then, that the anterior prolongation of the articulations between the lower end of the tibia and the astragalus and between the astragalus and os calcis are correlated and the causative agent would appear to be excessive flexion of the foot on the leg due, almost certainly, to the adoption of the squatting position.

### *The Physical Affinities of the Nal Race.*

In attempting to arrive at any conclusion regarding the physical affinities of these early inhabitants of North-Western India we are somewhat handicapped by the comparative paucity

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[1] F. F. Laidlaw, The Varieties of the Os Calcis. *Journal of Anatomy and Physiology*, Vol. XXXVIII (new series, Vol. XVIII), p. 136, 1903-04, London.

[2] R. B. S. Sewell, "A Study of the Astragalus," *Journal of Anatomy and Physiology*, Vol. XXXVIII (new series, Vol. XVIII), p. 431, 1903-04, London.

of human remains that have up till now been described from India and the neighbouring parts of Asia. Dixon [1] has put forward the view that in eolithic times India was inhabited by "a dolichocephalic, dark-skinned, Negroid population which was a blend in varying proportions of the Proto-Australoid and Proto-Negroid types". At a later period this primitive stock was over-run by a succession of immigrations, one of the earliest of which was in all probability that of the Caspian race, "which at a very early period had spread throughout most of the northern lowland and had forced its way across the eastern plateaus to Farther India and the eastern coast". This Caspian race was characterised by the possession of a long skull which also showed a high vault, the height considerably exceeding the breadth, and of a narrow nose, with at the same time a moderately high alveolar index; and, according to Dixon, this race has left considerable traces among the present-day inhabitants of the north-west portion of India and the Punjab. As Keith [2] points out, in attempting to determine the affinities of prehistoric peoples, "the conformation of the face, ................is a more reliable indication of breed and of race than is the shape of the cranium" and the characters of the Nordic or Caspian type on which he lays stress are that the face is long; the nose is high-pitched; there is a strongly developed shelf-like chin; the teeth are set regularly in an arch of moderate size; and there is a complete absence of any muzzle-like projection of the jaws.

With the exception of the excavations at Tinnevelly in South India and those recently carried out by the Archæological Survey of India at Nal in Baluchistan and at Mohenjo-daro and Harappa in the Indus Valley, we possess no information regarding the age or period, to which such remains, as have been found, belong. At these three last named spots excavation has now yielded extensive evidence of a culture that belongs to the Chalcolithic period; at all three sites the type of culture appears to be identical and it has been stated that it exhibits some degree of resemblance, though possibly only a remote one, to Sumerian culture (*vide* Illustrated London News, September 20, 1924; February 27 and March 7, 1926, London, and The Times of India Illustrated Weekly, March 7, 1926, Bombay). Sumerian remains have now been excavated at Ur and El Obeid in Babylonia [3] and at Kish in Mesopotamia [4] and objects, more particularly fragments of pottery, etc., showing supposed Sumerian affinities have been obtained in excavations in Thessaly [5], at Susa in Elam,[6] Anau in Turkestan [7] and from Honan and Manchuria.[8] This culture, if it all be of one type, appears to have extended throughout the whole width of Eastern Europe and Asia, from the Mediterranean shores to China: and as various views regarding the affinities of the human races in these areas have been expressed by authors who have based their conclusions in the main, if not entirely, on the cultural remains, it is as well to consider these views in detail and to see to what extent they are borne out, or otherwise, by the actual human remains that have been excavated.

Hall [9] in his account of the excavations at Ur, El-Obeid and Eridu attributes these finds to the Copper-age or thereabouts and probably to a very early copper age; he puts the date at about 3200-3600 B.C. These remains he regards as belonging to a primitive Sumero-Elamite

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[1] Dixon, The Racial History of Man, p. 241, *et seq.*, 1923, New York.
[2] Keith, The Antiquity of Man, Vol. I, p. 108, Second Edition, 1925, London.
[3] *Man*, pp. 1-7, January, 1925.
[4] Langdon, "Excavations in Kish", 1924, Paris.
[5] *Man*, p. 20, February 1925.
[6] The Cambridge Ancient History, Vol. I, pp. 579-80, 1923, Cambridge.
[7] Explorations in Turkestan by R. Pumpelly, Vols. I and II, 1908, Washington D. C.
[8] *Man*, pp. 17-21, February, 1925.
[9] *Man*, p. 5, January 1925.

population and culture. De Morgan [1] as a result of his excavations at Susa and a comparison of these with the finds made at Anau in Turkestan and in prehistoric Egypt concludes that they are all of one culture-type. Hall,[2] however, dissents from this: reviewing de Morgan's work he remarks "Certain superficial resemblances to the decoration of one of the types (and that the least common) of predynastic Egyptian pottery has led him to credit an ultimate connexion of the two ceramics, or even a common origin for both. But there is little real similarity." On the other hand he is of opinion that there seems to be a certain amount of evidence of an original connection between ancient Babylon and Pre-dynastic Egypt. This Sumerian type of culture he believes to have had an Eastern origin in pre-Aryan India and he claims that this view has received support from the discovery of supposed Sumerian remains at Mohenjo-daro in Sind and Harappa in Punjab. Babylonia in these early times was divided into two regions, in the north lay the Kingdom of Akkad, in which the inhabitants were Elamites, while to the south lay the Kingdom of Sumer. Hamy [3] has endeavoured to show that the true Sumerians were a brachycephalic race, and this, according to Dixon [4] agrees with what we know of the racial history of this region. As regards the race that lay further to the north in the Kingdom of Akkad, Langdon [5] expresses the opinion that "when we come to the second or realistic period of Elamite culture it will be seen that it belongs either to a branch of the Sumerian race or to a people of the same racial habits and customs", and he adds that in the Elamite "a high straight nose joins the cranium without appreciable depression at the bridge: the forehead is slightly receding. The axis of the eyes slopes slightly downwards from the inner to the outer corner, a phenomenon noticeable in many Sumerian heads. This type of eye and nose is characteristic of both Elamites and Sumerians". Hall [6] goes even further and states that "whether the Elamites, whom they (the Sumerians) probably civilised, were actually related to them we do not know, but it would appear probable that this was the case and the Sumer-Elamite race extended eastwards from Sumer through Elam and on into Turkestan and was also either identical with or at least very closely related to the primitive (pre-Aryan or Dravidian) inhabitants of Southern India." He claims that the Sumerians "were decidedly Indian in type. The face type of the average Indian of to-day is no doubt much the same as that of his Dravidian race ancestors thousands of years ago. Among modern Indians, as amongst modern Greeks or Italians, the ancient pre-Aryan type of the land has survived (as the primitive type of the land always does), while that of the Aryan conqueror died out long ago. And it is to this Dravidian Ethnic type of India that the Ancient Sumerian bears most resemblance, so far as we can judge from his monuments. He was very like a Southern Hindu of the Dekkan (who still speaks Dravidian language) and it is by no means improbable that the Sumerians were an Indian race".

It is in our opinion a very unsafe proceeding to argue an actual racial continuity because of a similarity of custom, culture or language. The Dravidian group was based originally on a similarity of language and as every student of physical anthropology knows, the linguistic system of classification is by no means satisfactory. Risley [7] has shown that in certain cases a similarity of physical type, such as that which exists between the Male of Rajmahal and the Oraon of Chota Nagpur, who are both Dravidians linguistically, and the Mundas and Santals, who are

[1] The Cambridge Ancient History, Vol. I, pp. 579-80, 1923, Cambridge.
[2] The Cambridge Ancient History, Vol. I, pp. 579-580, 1923.
[3] E. T. Hamy, *Bull. Mem. Soc. Anthrop.* (5th Series), Vol. VIII, pp. 116-132, 1907, Paris.
[4] Dixon, the Racial History of Man, p. 252, 1923, New York.
[5] Langdon, The Cambridge Ancient History, Vol. I, pp. 362-63, 1923.
[6] Hall, The Ancient History of the Near East, p. 173, 5th Edn., 1920.
[7] Risley Tribes and Castes of Bengal, 1891, Calcutta.

Kolarians, clearly shows a common racial stock, although the language used is of different origin; and the converse is equally true, for as Sergi [1] remarks, anthropology has made it clear that "there might be linguistic relationship without blood relationship, and that various peoples might have a common civilisation without having a common origin". Turner [2] defines the Dravidian type as possessing a skull that is usually dolichocephalic; the norma verticalis elongated and ovoid; vertex roof-shaped; the forehead only slightly receding; the height usually greater than the breadth; the glabella and supra-orbital ridges not marked; the face orthognathous; the nasal index platyrrhine; the orbit usually low in relation to its height (mesoseme); palate a wide horse-shoe (brachyuranic); the cubic capacity averages 1249 ccs." It follows then that, if the Sumerians and Elamites are of one race, the race type was apparently brachycephalic with a high straight nose; they cannot, therefore, be regarded as Dravidian, since the latter are dolichocephalic with a broad, thick nose.

The actual skulls excavated at Anau [3] in Turkestan show that the race to which they belonged possessed a skull that was of a long type and belonged to the dolicho-mesaticephalic group but was leptorrhine, so that if Hamy is right (as he appears to be from the evidence of the crania excavated at Kish) in his conclusion regarding the brachycephalic head-form of the true Sumerian, the Turkestan race must also have been physically different from, though possessing some elements of the same culture (*e.g.* pottery) as the Sumerians, and also different again from the modern Dravidian type. In this connection, however, it is worth noting that Buxton [4] has put forward the view that the earliest inhabitants of South India, the pre-Dravidians, as he terms them, are really an offshoot of the Brown or Mediterranean race; but that this invasion from the north occurred in two stages, the earlier immigrants exhibiting the broadest nose, while the later have this character less developed. He attributes this widening of the nose entirely to an adaptation to climatic conditions, the change being most advanced in the earlier immigrants. This theory, however, has not received acceptance from other anthropologists, and the author does not appear to have fully considered the large mass of facts that goes against his theory [5]. In view of Hall's suggestion regarding the possible identity of the Sumerians and the early inhabitants of South India, it is a matter of both interest and importance to compare the physical types of these two races. The most primitive inhabitants of India are to be found now-a-days in the aboriginal races of Southern India and the Veddahs of Ceylon. It is always a somewhat unsafe proceeding to attempt to compare a few skulls of a prehistoric race with the average obtained from the examination of numerous skulls of a modern people. So much intermixture of races and nationalities has taken place during the intervening period that a racial type may have been profoundly modified and only a careful statistical examination of individual measurements, which up till now has been carried out in but few instances, will resolve the mass of material into its original components and reveal its true origins. We are, however, fortunate enough to have before us a series of skulls belonging to the early inhabitants of Southern India, which have been excavated at Aditanallur in Tinnevelly [6]. In the absence of a proper stratigraphic study no definite age can be assigned to the Tinnevelly site, for both iron and copper have been found intermixed. As far as can be judged from the published accounts, it appears probable that the

[1] Sergi, "The Mediterranean Race", Contemporary Science Series, p. 4, 1901, London.

[2] Turner Craniology of the People of India, *Trans. Roy. Soc. Edin.*, Vol. XL, p. 107, 1905.

[3] Explorations in Turkestan by R. Pumpelly, Vols. I & II, 1908, Washington D. C.

[4] L. H. D. Buxton, The Peoples of Asia, pp. 136-37, 1925, London.

[5] A. C. Haddon, The Races of Man, pp. 145-46, 1924, Cambridge and B. S. Guha, Man in India, *The Modern Review*, pp. 526-27, 1926, Calcutta.

[6] Prehistoric Antiquities in Tinnevelly, *Archæological Survey of India Annual Report*, p. 117, *et seq.*, 1904, Calcutta.

site belonged either to a late epoch of the Copper-age, when iron was beginning to be introduced, or more likely to the commencement of the Iron-age when copper was still abundantly used. In any case the site appears to be of considerable antiquity though later than those of Nal and the North Kurgan of Anau. One of us (Guha) is now examining these skulls and hopes in the near future to publish a full account of them ; it is, therefore, impossible at present to give any details regarding this early race and it must suffice to say that a preliminary examination shows that they appear to conform closely to the type that the Sarasin brothers consider to be the primitive Veddah race [1], and belong to what Dixon terms the original Proto-Australoid Proto-Negroid stock. It might be argued that these south Indian inhabitants and the Anau race are identical, for the general conformation of the skulls is very similar ; but such a conclusion is rendered somewhat doubtful by the different configuration of the nose, which is stated to be narrow in the Anau race and is broad in the Tamil and Veddah. The latter appear to be the descendants of the original Proto-Australoid and Proto-Negroid blend, while the Anau race seems to belong to the Mediterranean race or possibly to a blend of the Mediterranean and Caspian races, for Dixon [2] remarks that "the archæological evidence furthermore indicates that in the Bronze age, and probably long before, the Caspian type was dominant in the population of Southern Siberia, having reached China and Japan by the end of Neolithic times. We know also that in the middle of the Second Millennium B.C. or thereabouts, peoples of the type came in large numbers into Northern India from the northwest".

It is unfortunate that Sergi [3] was able to take but few measurements of the only two adult skulls that were obtained at Anau and, moreover, the only side view [4] of the skull that he gives is, so far as can be judged, not a true *norma lateralis*. The photograph is, apparently, taken from slightly above, so that the skull appears to be tilted somewhat towards the camera and not strictly orientated according to the Frankfort Agreement. Consequently the outline of the skull can only doubtfully be compared with that of the "Nal" or the "Sialkot" crania. Judging however from the low arch of the cranial vault of the Anau skull (shown also by the comparatively small auricular height, which is only 107 mm.) the skull is of a different type to that represented by the "Nal" cranium. The supposed female sex of the individual to whom the Anau skull belonged cannot altogether be ignored in this connection; the difference is, however, in our opinion too great to be due merely to the difference of sex. A comparison of the Anau skull with those of the early inhabitants of Egypt, prior to the Dynastic period, exhibits a quite marked degree of similarity, and there is also a very close agreement between the skulls of the pre-dynastic Nagadah race, the Anau skulls and a prehistoric skull that was excavated at Thessaly and was described by Duckworth [5]. In all three regions the skull is dolicho-or dolicho-mesaticephalic ; the vault is comparatively low and the forehead slopes backwards.

We now come to the consideration of the human remains excavated at Kish and reported on by Buxton [6]. An examination of the skulls shows clearly that two distinct races are represented, one brachycephalic and the other markedly dolichocephalic. The widespread occurrence of these two types in the prehistoric remains of both Europe, Northern Africa and Western Asia is somewhat remarkable, and it is interesting to note that the recent excavations have also revealed their presence at Mohenjo-daro. Of these two types Buxton regards the brachycephalic

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[1] Sarasin, Ergebnisse Naturwissenschaftlicher Forschungen auf Ceylon, Vols. I & II, 1887-1893, Wiesbaden.
[2] Dixon, Racial History of Man, p. 483, 1923, New York.
[3] Explorations in Turkestan, Vol. II, part VII, pp. 445-46, 1908, Washington D. C.
[4] Explorations in Turkestan, Vol. II, part VII, plate 92, 1908.
[5] *Man*, Vol. XI, pp. 49-50, 1911.
[6] "On the human remains excavated at Kish," Excavations at Kish, (Appendix) by Langdon, p. 115, 1924, Paris.

as the true Sumerian; the other dolichocephalic skulls are regarded by Langdon as immigrants from the Semitic race that was at that time inhabiting Arabia, and Buxton has compared these skulls with those of predynastic Egyptians and has pointed out the close similarity between them and he considers that these long-headed Kish people were in all probability representatives of a branch of the Mediterranean race, though possibly exhibiting a local variation, while the brachycephalic individuals are believed by him to be representatives of the western Alphine stock and probably of the Armenoid branch. At Nal only the long-headed race is represented in the collection, but a comparison of this skull with those excavated at Kish shows that there is a fairly close resemblance between them. It is interesting to compare the measurements and other characters of these dolichocephalic Kish skulls with those of the 'Nal' skull and in the following table 4 we have given these in parallel columns, for ease of comparison, and we have also given certain measurements of the Combe-Capelle skull. Buxton remarks that in the Kish skulls "the general *cranial* form is similar to that of the Combe Capelle man", and the same is true of the 'Nal' skull. The 'Nal' skull differs from the dolichocephalic Kish skulls in the greatly increased height of the vault, as shown by the auricular height, which, however, exactly agrees with the measurement of the Combe Capelle man; and from both Kish and Combe Capelle skulls in the shorter and slightly broader cranium. The face also differs slightly and is less broad. These differences are, however, only a question of degree and in the Kish skulls 1 and 5 (*vide* Buxton [1], Pl. XLVI, fig. 1 and pl. XLVII, fig. 1) we get a type of vault that closely resembles that of the 'Nal' and 'Sialkot' crania, the forehead passing up into an even curve that extends round the fronto-parietal region as far as the occiput. In certain other respects, such as the alveolar prognathism, the moderate depth of the glenoid fossa and the comparatively small size of the mastoid process, the 'Nal' skull approximates to the Kish long-headed type and we have no hesitation in referring both to a branch of the Mediterranean race.

The Mediterranean type was strongly represented in the Nile Delta in the earliest dynastic period and was the predominant type in the earlier Minoan periods of Crete and in Southern Siberia in the Bronze-age. This type appears to have had its origin in the neighbourhood of the Eastern Mediterranean and Black Sea, while the Caspian type appears to have arisen in the great Eur-Asiatic steppe region of South-Eastern Russia and South-Western Siberia. It seems probable that by the time of the Copper-age at Anau the Mediterranean race had spread around the shores of the Mediterranean and across Arabia and Babylonia into Turkestan, possibly becoming somewhat mixed with the Caspian race as it proceeded eastward, and, according to Buxton, an early offshoot had migrated into South India and had undergone a modification of the nose from a leptorrhine to a platyrrhine type as a result of climatic conditions. We do not agree with Buxton; but even if we admitted the correctness of his view, then the "Proto-Australoid-Proto-Negroid" stock of Dixon would have to be regarded racially as a descendant of the Mediterranean race, which, for reasons stated above, is in direct opposition to Hall's theory of a migration from South India to Sumer, since the true Sumerians, according to Buxton, belong to a brachycephalic race and are, therefore, descendants from an entirely different stock. As we have already mentioned, Buxton is of opinion that the brachycephalic skulls from Kish exhibit features indicating that they belong to the Armenoid branch of the western Alpine stock. On the other hand, among the skeletal remains excavated by the Archæological Survey of India at Mohenjo-daro in Sind we again get the same two perfectly distinct types: of these one is dolichocephalic and is clearly related to, if not actually identical, with the long-headed type

[1] Buxton, "On the human remains excavated at Kish" in Excavations at Kish, Vol. I, p. 115, 1924, Paris.

from Nal and Kish, but the brachycephalic type, of which we have two examples, one adult and the other a child, exhibits certain features that in our opinion point to a Mongoloid rather than an Armenoid origin.

## TABLE 4.

*Comparative measurements of the Nal and other Crania.*

| | Kish dolichocephalic skull. | | | | Average. | Nal Skull. | Combe capelle skull. |
|---|---|---|---|---|---|---|---|
| | No. 3 | No. 4. | No. 5. | No. 7. | | | |
| Measurements. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| Glabello-Occipital Length . | 193 | 191 | 193 | 189 | 191·5 | 188·5 | 198 |
| Greatest breadth . . . . . | 129 | 132 | 134 | 128 | 130·7 | 132·0 | 130 |
| Min. Frontal width . . . | 88 | 92 | .. | .. | 90·0 | 93·0 | .. |
| Biyygomatic breadth . . . | 125? | 137 | .. | .. | 131·0 | 120 | .. |
| Bi-malar breadth . . . . | 93 | 89 | .. | .. | 91·0 | 92 | .. |
| Basi-bregmatic, height . . . | 137 | 127 | 133 | .. | 132·3 | 146 | .. |
| Nasi alveolar height . . . | 62† | 62† | .. | .. | 62·0 | 72 | .. |
| Ophryo-alveolar height . . . | 90 | 90 | .. | .. | 90·0 | 89·0 | .. |
| Basi-alvoelar length . . . | 97 | 95 | .. | .. | 96·0 | 90 | .. |
| Orbital height . . . . . | 32* | 33* | .. | .. | 32·5 | 33 | .. |
| Orbital width . . . . . | 44* | 38* | .. | .. | 41·0 | 40 | .. |
| Inter-orbital width . . . . . | 23 | 24 | .. | .. | 23·5 | 20·0 | .. |
| Nasal height . . . . . . | 54 | 54 | .. | .. | 54·0 | 49·0 | .. |
| Nasal width . . . . . . | 24 | 24 | .. | .. | 24·0 | 23 | .. |
| Auricular height . . . . . | .. | .. | .. | .. | .. | 120 | 120 |
| Length of Palate . . . . . | 52 | 52 | .. | .. | 52·0 | 53 | 51 |
| Width of Palate at 2nd Molar . . | .. | .. | .. | .. | .. | 65 | 64 |
| Length of Molar Teeth . . | .. | .. | .. | .. | .. | 30 | 28·5 |
| *Indices.* | | | | | | | |
| Cephalic index . . . . . | 66·84 | 69·11 | 69·43 | 67·70 | 68·27 | 70·0 | 65·7 |
| Vertical index . . . . . | 70·98 | 66·49 | 68·91 | .. | 68·79 | 77·45 | .. |
| Facial index . . . . . . | 49·6 | 45·2 | .. | .. | .. | 60·0 | .. |
| Orbital index . . . . . . | 72·73 | 86·84 | .. | .. | 79·78 | 82·5 | .. |
| Nasal index . . . . . . | 44·44 | 44·44 | .. | .. | 44·44 | 46·9 | .. |
| *Estimated Cranial Capacity ccs* . | 1409 | 1328 | 1420 | 1431 | 1397·0 | 1443·2‡ | 1440 |

* Owing to a printer's error in Buxton's account of the Kish skull the orbital widths and heights were transposed.

† The great difference (10 mm.) between this measurement in the Nal and Kish skulls appear to be due to the remarkably short distance from the lower margin of the pyriform aperture to the alveolar margin in the latter skulls. If the Nasal height is 54 and the Nasal alveolar height 62, measurements which Mr. Buxton in a letter to one of us (R.B.S.S.) states are correct, then the distance from the lower margin of the pyriform aperture to the alveolar margin is in the neighbourhood of only 8 mm. In the Nal skull it is 24 mm.

‡ Average of three calculations (*vide* p. 65.)

Of the three primitive skulls obtained from north-western India that we have referred of in this report, namely the Bayana, Sialkot and Nal crania, the last two show close affinities with each other and almost certainly belong to a single race and are apparently representatives of the Mediterranean stock; but the Bayana [1] cranium has a lower vault and a higher bregma-index, which may indicate a certain degree of admixture of the Mediterranean with some other type. The Bayana cranium is much older than the other two, so far as can be determined from the stratum in which it was found (*vide supra* p. 56), and, if its early age and affinities to the Mediterranean race be conceded, it would seem probable that the Mediterranean stock had become established in Northern India at a period that clearly antedates the civilisation at Nal and along the Indus valley, and the differences that have been shown to exist between the human remains at Anau, Kish and Nal indicate that a sufficient length of time had elapsed for certain local variations to have become evolved and established.

To sum up the evidence before us, it seems clear that there was in these early times a number of distinct races inhabiting different parts of India and the region to the north and west. At the southern end of the Indian Peninsula we find the descendants of the Proto-Australoid-Proto-Negroid blend. In the north and west we have the descendants of the great Mediterranean stock, and mixed with these are certain round-headed types that may be derived, as is suggested for the Kish remains, from the western division of the Alpine stock and more particularly from the Armenoid race, or possibly in the Indus Valley from the Eastern or Mongoloid race.

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[1] Keith, *Journal of the Anthropoligical Society of Bombay*, Vol. XI, p. 672, 1917, Bombay.

## CATALOGUE OF BONES CONTAINED IN THE COLLECTION.

*No. 1.*

Human adult skull from group F.

*No. 2.*

Found on 16th May 1923 close to vessels of group I.

1 Human tooth (? 2nd incisor).

*No. 3.*

From vessel A. 8.

Upper end of a (?) metatarsal bone (Human).

*No. 4.*

Found in vessel A. 9.

Broken fragment of a rib.

*No. 5.*

Found in vessel A. 10.

Broken fragment of a rib.

*No. 6.*

Found on 27th May 1925 near C vessels.

5 pieces of bone (incised). Bone fragmentary and impossible to determine its source.

*No. 7.*

From group F. in vessels 1-6.

1 third right metatarsal Human.

1 portion of a rib (? small mammal).

1 portion of a scapula of a small mammal about the size of Gazelle.

*No. 8.*

From C. 4.

1 molar tooth of the lower jaw. Crown very much worn.

*No. 9.*

Trench E (30th May 1925).

*Remains of one infant approximately 1 year old.*

1. Broken pieces of the skull with sub-and ex-occipital bones complete.
2. Portion of upper jaw.
3. Part of lower jaw with incisors uncut.
4. 8 pieces of vertebræ.
5. 26 fragments of ribs.
6. The right clavicle.
7. Portion of right scapula.
8. Lower ends of a pair of humeri.
9. Upper ends of a pair of ulnas.
10. Upper portions of a pair of radii.
11. A pair of metacarpal bones.
12. The first phalanx of the thumb.

13. Portions of os innominatum.
14. Upper halves of the right and left femora.
15. Upper end of a tibia.
16. Broken shaft of the left fibula (without the epiphyses).

*No. 10.*

Group E.

Bones from a large broken vessel found, together with 5 other vessels, in Room 6.

*Remains of apparently one individual (? female).*

1.
2. } Fragments of ribs.
3.
4. Part of shaft of right radius.
5. Lower end of right radius.
6. Portion of os innominatum with complete acetabulum. Right side.
7. Portion of os innominatum ; crest of Ilium, continuous with 6.
8. Ischio-pubic bones of os innominatum. Left side.
9. Auricular facet of os innominatum. Right side.
10. Fragments of os innominatum.

One bone pin (? hair ornament).

Broken bit of pottery (painted with black horizontal lines and a diagonal pattern).

*No. 11.*

Bones from the little grave. South of Room 8.

*Remains of one infant.*

1. Broken fragments of cranial bones.
2. Fragments of ribs.
3. Fragments of vertebræ.
4. Right scapula.
5. Lower ends of two humeri (a pair).
6. Upper ends of two ulnas (a pair).
7. Os innominatum.
8. Upper end of shaft of right femur.
9. Lower end of shaft of femur.
10. Upper ends of one tibia. Cnemial index 87·5.
11. One complete tibia (in two fragments).

*No. 12.*

Bones with the 16 beads in the little grave in Trench E.

*Remains of one child (older than No. 11).*

1. Fragments of cranial bones.
2. Fragments of ribs.
3. Fragments of vertebræ.
4. Right clavicle.
5. Right humerus.
6. Lower end of left humerus.

7. Portions of two radii (a pair).
8. Portions of two ulnas (upper ends). A pair.
9. Os innominatum.
10. Upper ends of two femora (a pair).
11. Upper ends of two tibiæ (a pair). Cnemial index of the left tibia 84·2.
12. One fibula.
13. Portions of other long bones.
14. Phalanges.

*No. 13.*

1. Two Phalanges and a portion of a rib of a small mammal about the size of a Gazelle or Musk Deer. (Similar in size to those of Lot 15.)
2. Portion of a rib of large mammal. Size of an ox.

*No. 14.*

Group B from Room 6.

*Remains of two adults, one youth (aet 18 approx.) and one child.*

1. Pieces of cranial bones.
2. Body of lumbar vertebra.
3. Portion of os innominatum.
4. Portion of os innominatum.
5. A dorsal vertebra.
6. Upper end of meso-sternum.
7. Portion of a rib.
8. Outer end of left clavicle.
9. Lower end of humerus.
10. Lower end of humerus.
11. Part of upper end of right radius.
12. Shaft of radius.
13. Upper end of right ulna; adult.
14. Upper end of right ulna; adult.
15. Upper end of left ulna; adult.
16. Upper end of left ulna; adult.
17. Shaft of radius.
18. Os magnum.
19. 1st Metacarpal
20. 1st Metacarpal.
21. 1st Phalanx (? Index finger).
22. Upper end of shaft of right femur. Aged 18 approx
23. Upper end of right femur; child.
24. Portion of Patella.
25. Portion of shaft of tibia. Index of platycnemia 68·7. Sagittal Diameter 32. Transverse diameter 22.
26. Portion of head of tibia.
27. Portion of shaft of long bone.
28. Portion of shaft of fibula.
29. Upper end of fibula of a child.

30. Portions of long bones, containing deposit of Gypsum in the medullary cavities.
31. Calcaneum.
32. 1st metatarsal (Great toe of left side) Max. length 70 mm. Breadth 16·5 mm.
33. 3rd right metatarsal, Max. length 70 mm. Breadth 14 mm.
34. 3rd left metatarsal. Max. length 76 mm. Breadth 13·5 mm.
35. Proximal end of 3rd left metatarsal.
36. Distal end of 3rd (? right) metatarsal.
37. Proximal end of 5th left metatarsal.
38. Portion of long bone of a bird.
39. Astragalus of a large mammal. ? ox or buffalo.

*No. 15.*

Group I from Room I.

This set of bones contains the remains of at least four adults and two children, one of whom was of about 6 years old and the other an infant.

*Skull.*

1. Fragments of both rami, right and left, of a mandible (adult) apparently of the same individual. In each case the angle between the horizontal ramus and the body of the mandible is 115°.
2. Portion of the right half of the body of a mandible (adult).
3. Ascending left ramus and angle of a mandible (of a small but apparently adult individual). Ridges for muscular attachment well marked and the angle between the ascending ramus and body is 108°.
4. Neck and condyle of a mandible.
5. Two portions of mandible of a child aged 6 years approx. The 1st incisor of the permanent dentition has not yet been cut though fully formed.

Note.—Contained in an envelope, marked " East side of A, level with pots (20th May 1925) " was a third fragment that exactly fits these other two and completes the whole anterior arch of the mandible. The mental protuberance is well marked for a child.

6. Fragments of a child's skull, probably of the same individual as the lower jaw.
7. Fragments of the cranium of an infant.

*Vertebral column.*

8. Cervical vertebra of an adult.
9. Cervical vertebra of a child.
10. Dorsal vertebra of an adult.
11. }
12. }
13. } Portions of dorsal vertebræ of adult individual or individuals.
14. }
15. }
16. Lumbar vertebra of an adult. } Probably of the same individual.
17. Lumbar vertebra of an adult. }
18. Lumbar vertebra of an adult; apparently of a different individual.

19. Body of Lumbar vertebra of an adult.
20. Body of Lumbar vertebra of a child.

*Ribs.*

21 to 27. Fragments of ribs.

*Pelvis.*

28. 29. Fragments of os innominatum.

*Upper extremity.*

30. Inner end of a left clavicle; large adult.
31. Outer end of a left clavicle; second adult.
32. Inner end of a left cla icle; adult.
33. Portion of the head of a humerus; young individual under 20 years.
34. Shaft of humerus.
35. Shaft of a radius.
36. Upper end of a right radius. } Probably from the same adult individual.
37. Upper end of a left radius. }
38. Upper end of a right radius (adult).
39. Portion of a long bone (? radius).
40. Upper end of a right ulna (adult).
41. Upper portion of left ulna of a child.
42. Trapezium.
43. Right 3rd metacarpal. Max. length 67·5 mm. Breadth 10·5 mm. } Almost certainly a pair.
44. Left 3rd metacarpal. Max. length 67·5 mm. Breadth 10·0 mm. }
45. Right 3rd metacarpal. Max. length 71·5 mm. Breadth 10·0 mm.
46. Right 5th metacarpal. Max. length 59·2 mm. Breadth 10·0 mm.
47. Basal part right 3rd metacarpal.
48. Basal part right 3rd metacarpal.
49. Basal part 5th metacarpal.
50. 1st phalanx of thumb. Max. length 33 mm. Breadth 11·5 mm.
51. 1st phalanx of a finger.
52. 1st phalanx, probably of middle finger. Max. length 48·5 mm. Breadth 11 mm.
53. 1st right metacarpal. Max. length 48·5 mm. Breadth 12 mm.

*Lower extremity.*

54. Head of left femur; child.
55. Broken shaft of a femur; adult.
56. Part of lower end of a femur.
57. Portion of femur of a child.
58. Upper end of right femur of an infant.

59. Lower end of a left fibula.

60. Broken fragments of long bones.

61. 3rd left metatarsal. Max. length 76 mm. Breadth 11 mm.

62. Portion of 3rd metatarsal.

63. 1st Phalanx of great toe. Max. length 35·5 mm. Breadth 15 mm.

*Addenda.*

64. Portion of cranial bones of adult.

65. Small fragment of a vertebra.

66. Molar tooth of adult (2nd molar of lower jaw ?).

*In envelope marked " East side of A. level with pots. 20th May 1925 ".*

1. Two teeth, (deciduous) incisors of children.
2. Fragment of lower jaw of a child, *vide* No. 5 *supra.*
3. Portion of a mandible, angle 100°.

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# INDEX


PAGE.

Aditanallur skulls, . . . . . . . . . . . . **35,** 76, 77

Akkad—
Elamites, inhabitants of —, . . . . . . . . . . . **35,** 75

Anau—
cattle bones at —, . . . . . . . . . . . **35,** 68
excavations at —, . . . . . . . . . . . **35,** 59
Nāl crania compared with —, . . . . . . . . **35,** 77

Antiquities—
at Mohenjodaro, . . . . . . . . . . . **35,** 38
list of the — found at Sampur, . . . . . . . . **35,** 8—16
list of the — found at Sohr Damb, . . . . . . . **35,** 40—55

Appendices—
of Sampur Mound, Mastung, . . . . . . . . . . **35,** 8—16
of Sohr Damb, Nāl, . . . . . . . . . . . **35,** 40—55

Armenoid branch—
Kish skulls belong to —, . . . . . . . . . . **35,** 78

Babylon—
connection with Pre-dynastic Egypt, . . . . . . . **35,** 75
early description of —, . . . . . . . . . . . **35,** 75

Badagas of Nilgiri Hills, . . . . . . . . . . . **35,** 61

Baluchistan—
ancient sites of— . . . . . . . . . . . . **35,** 39
dambs in —, . . . . . . . . . . . . **35,** 1
dolichocephalic people in —, . . . . . . . . . **35,** 39
graveyards in —, . . . . . . . . . . . . **35,** 59

Bauri caste burial customs, . . . . . . . . . . **35,** 62

Beads—
found at Nāl, . . . . . . . . . **35,** 24, 26, 27, 28, 32, 33, 34
found at Sampur, . . . . . . . . . . . . **35,** 6

Bengal—
Hindus of —, . . . . . . . . . . . . **35,** 61, 62

Bond, Mr. Clinton, . . . . . . . . . . . . **35,** ii

Bones—
bird and mammal —, . . . . . . . . . . . **35,** 57
found at Nāl, . . . . . . . . . **35,** 21—28, 30, 34, 56
gypsum deposit in —, . . . . . . . . . . . **35,** 60, 63
no trace of fossilization, . . . . . . . . . . **35,** 60
pin —, at Ghiaur Kala, . . . . . . . . . . **35,** 58

Brahui workmen. . . . . . . . . . . . . **35,** ii, 19

Bricks—
at Mastung, sizes of —, . . . . . . . . . . **35,** 3
at Nāl, sizes of —, . . . . . . . . . . . **35,** 19, 27, 29

PAGE.

Bronze—
Age, human remains of —, . . . . . . . . . . . . 35, 57
casket of —, . . . . . . . . . . . . 35, 9
centaur of —, . . . . . . . . . . . . 35, 6
coin of —, . . . . . . . . . . . . 35, 9
Crania of Bronze Age, . . . . . . . . . . . . 35, 63

Burials—
adult's —, . . . . . . . . . . . . 35, 25
bronze age —, . . . . . . . . . . . . 35, 26
complete —, . . . . . . . . . . . . 35, 26
copper age —, . . . . . . . . . . . . 35, 26
fractional or incomplete —, . . . . . . . . . . 35, 21, 28
infant's —, . . . . . . . . . . . . 35, 32
stratum —, . . . . . . . . . . . . 35, 32, 36
Sweeper caste —, . . . . . . . . . . . . 35, 62

Burial customs—
of Bauri caste, . . . . . . . . . . . . 35, 62
of Dhotas, . . . . . . . . . . . . 35, 62
of Domes, . . . . . . . . . . . . 35, 62
of Egyptians, . . . . . . . . . . . . 35, 26
of Gypsies, . . . . . . . . . . . . 35, 62
of Itonamas, . . . . . . . . . . . . 35, 62
of Irulas, . . . . . . . . . . . . 35, 58
of Koras, . . . . . . . . . . . . 35, 62
of Kurmis, . . . . . . . . . . . . 35, 62
of Mahilis, . . . . . . . . . . . . 35, 62
of Udayas, . . . . . . . . . . . . 35, 58
Caspian race in early India, . . . . . . . . . . 35, 74
Cerrusite, . . . . . . . . . . . . .35, 29, 31, 33, 44
Chalcolithic Age — human remains at Nāl in —. . . . . . . . 35, 61

Coin—
given by Bagadas to dying man, . . . . . . . . . 35, 61
Indo-Scythian type —, . . . . . . . . . . 35, 5
'Rasi fanam,' small gold —, . . . . . . . . . 35, 61
Combe Capelle skull — measurements of — . . . . . . . . 35, 79

Copper—
Age, study of remains, . . . . . . . . . . . 35, 57
see Appendix I . . . . . . . . . . . . 35, 40
see also Appendix A . . . . . . . . . . . 35, 12
bead of —, . . . . . . . . . . . . 35, 33

Corpses—
treatment, in ancient times, of —, . . . . . . . . . 35, 58
exposure of —, . . . . . . . . . . . 35, 58

PAGE.

Cranium—
from Bayana, . . . . . . . . . . **35,** 56, 60—66, 80
of Bronze Age . . . . . . . . . . . . . **35,** 63
Coronal suture of Nāl —, . . . . . . . . . **35,** 64
from Sialkot, . . . . . . . . . . . . **35,** 56, 80
Veddah crania, . . . . . . . . . . . . **35,** 66

Cups—
drinking —, . . . . . . . . . . . . . **35,** 31
from Susa, . . . . . . . . . . . . . **35,** 36
silver —, . . . . . . . . . . . . . **35,** 4

Dambs—
in Baluchistan, . . . . . . . . . . . . **35,** i
incomplete burials in —, . . . . . . . . . . **35,** 28
of Buddhist period, . . . . . . . . . . . **35,** ii
Deas, Col., I.M.S., C.M.O., . . . . . . . . . . **35,** ii
Dhotas of Orissa—burial customs . . . . . . . **35,** 62
Domes—burial customs of —, . . . . . . . . . **35,** 62
Elamites, . . . . . . . . . . . . . . **35,** 75, 76
Eridu excavation, . . . . . . . . . . . . **35,** 74

Excavations—
age of finds in —, . . . . . . . . . . . **35,** 74
at Anau, . . . . . . . . . . . . . **35,** 59
see Mastung, . . . . . . . . . . . . **35,** 1—7
see Nāl, . . . . . . . . . . . . . **35,** 17—39
at El-Obeid, . . . . . . . . . . . . **35,** 74
at Eridu, . . . . . . . . . . . . . **35,** 74
at Ur, . . . . . . . . . . . . . **35,** 74
Faqir Muhammad, Sardar, . . . . . . . . . . **35,** ii
excavation by —, . . . . . . . . . . . **35,** 18

Femur, ' Nāl '—
highly developed—, . . . . . . . . . . . **35,** 72
of youth, . . . . . . . . . . . . . **35,** 71
high degree of Platymeria in —, . . . . . . . . **35,** 71

Figurines—
at Harappa, . . . . . . . . . . . . . **35,** 59
at Mohenjodaro, . . . . . . . . . . . . **35,** 59
at Sampur, . . . . . . . . . . . . . **35,** 8
at Sohr Damb, Nāl, . . . . . . . . . . . **35,** 42—43
Fossilization of bones, no trace of, . . . . . . . **35,** 60
Galena, . . . . . . . . . . . . . . **35,** 29, 33, 44
Gandhara monuments . . . . . . . . . . . **35,** 20
Guha, Dr. B. S.,—reports on Nāl bones, . . . . . . **35,** 21, 22, 24
Guide's Mess, Mardan—Graeco Buddhist sculptures in —, . . . . . **35,** 4
Gumbadi, inhabitants of, . . . . . . . . . . . **35,** 38
Gypsum deposit in bones, . . . . . . . . . . **35,** 60, 63
Gypsy burial customs,. . . . . . . . . . . . **35,** 62

PAGE.

Harappa—
- discoveries at —, . . . . . . . . . . . **35**, 1
- figurines of cattle at —, . . . . . . . . . **35**, 59
- patterns on pottery at —, . . . . . . . . . **35**, 37
- seals and cherts at —, . . . . . . . . . . **35**, 38

Hazara Pioneers—operations of —, . . . . . . . . **35**, 18, 19

Hindus of Bengal, . . . . . . . . . . . **35**, 61, 62

Horu clan of the Miragi Mengals, . . . . . . . . **35**, 58

Indo-Parthian stratum at Taxila . . . . . . . . **35**, 4

Indus Basin—
- sites in —, . . . . . . . . . . . **35**, 37, 38
- unknown civilisation in —, . . . . . . . . . **35**, i

Inhabitants—
- early —, of India, . . . . . . . . . . **35**, 80
- early —, of South India, . . . . . . . . . **35**, 76
- early Mediterranean stock, . . . . . . . . . **35**, 80
- Sumerian —, . . . . . . . . . . . **35**, 75
- Veddhas, most primitive —, . . . . . . . . . **35**, 76

Iron Age—
- beads of —, . . . . . . . . . . . **35**, 33
- in Southern India, . . . . . . . . . . **35**, 33

Irulas re-use grave, . . . . . . . . . . . **35**, 58

Itonamas—burial customs of —, . . . . . . . . . **35**, 62

Jacob, General Sir Claud . . . . . . . . . . **35**, 17, 18

Jhalawan—
- houses of —, . . . . . . . . . . . **35**, 38
- Mamatava and Nichara in —, . . . . . . . . . **35**, 39
- Nāl in —, . . . . . . . . . . . **35**, 17
- population of —, . . . . . . . . . . . **35**, 19
- Sohr Damb in —, . . . . . . . . . . **35**, ii

Johnston, Sir Frederick . . . . . . . . . . **35**, ii

Kalat State—
- Nāl —, . . . . . . . . . . . . **35**, 17
- revenue in kind in —, . . . . . . . . . . **35**, 5

Kayes, T. H., Lt.-Col. . . . . . . . . . . **35**, ii

Kish—
- dolichocephalic skull at —, . . . . . . . . . **35**, 79
- human remains at —, . . . . . . . . . . **35**, 77, 78
- skulls from —, . . . . . . . . . . . **35**, 68

Koras, burial customs of —, . . . . . . . . . **35**, 62

Kurmis, burial customs of —, . . . . . . . . . **35**, 62

Laghor Zard, . . . . . . . . . . . . **35**, 39

Lahore, vase in museum at —, . . . . . . . . . **35**, 5

Leaden Slag, . . . . . . . . . . . . **35**, 33, 44

PAGE.

Limestone—
at Nāl, . . . . . . . . . . . . **35,** 33, 41
at Sampur . . . . . . . . . . . **35,** 6, 8, 9, 10
Mahilis, burial customs of —, . . . . . . . . . . **35,** 62
Makran—
ancient inhabitants of —, . . . . . . . . . . **35,** 38
corpses, exposure in —, . . . . . . . . . . **35,** 58
operations of Mockler in —, . . . . . . . . . **35,** i
Marshall, Sir J. H.—note on vessels from Sohr Damb, Nāl . . . . **35,** ii, 36
Mastung—
excavations at —, . . . . . . . . . . **35,** 2
position of —, . . . . . . . . . . . **35,** 1
Sampur Mound in —, . . . . . . . . . . **35,** ii
McMahon Museum—
antiquities in —, . . . . . . . . . . . **35,** 39
Bond, Clinton, Curator of —, . . . . . . . . **35,** ii
vessels from Mastung in —, . . . . . . . . . **35,** 4
vessels from Nāl in —, . . . . . . . . . . **35,** 18
Mediterranean peoples, early, . . . . . . . . . . **35,** 80
Mesopotamia, . . . . . . . . . . . . . **35,** 7, 38
Mian Gundi Mound, . . . . . . . . . . . . **35,** 39
Mir Shams Shah, Nawab, Sir . . . . . . . . . . **35,** ii
Mockler—
operations in Makran of —, . . . . . . . . . **35,** i
records incomplete burials, . . . . . . . . . **35,** 28
Mohenjodaro—
antiquities of —, . . . . . . . . . . . **35,** 38
beads at —, . . . . . . . . . . . . **35,** 33
cattle figurines found at —, . . . . . . . . . **35,** 59
city site at —, . . . . . . . . . . . . **35,** 38
discoveries at —, . . . . . . . . . . . **35,** 1
pottery patterns at —, . . . . . . . . . . **35,** 37
skeleton at —, . . . . . . . . . . . . **35,** 60
Moussian—
designs on pottery at —, . . . . . . . . . . **35,** 37
fractional burials at —, . . . . . . . . . . **35,** 28
tombs at —, . . . . . . . . . . . . **35,** 28
Mula Pass, . . . . . . . . . . . . . . **35,** 39
Nāl—
bird and mammal bones at —, . . . . . . . . . **35,** 57
bones found at —, . . . . . . . **35,** 21—28, 30, 34, 56, 61, 64, 67
chalcolithic age at —, . . . . . . . . . . **35,** 56
crania found at —, . . . . . . . . . . . **35,** 80
femur found at —, . . . . . . . . . . . **35,** 72
fossilization in bones, no trace, . . . . . . . . **35,** 60
Os Calcis at —, . . . . . . . . . . . . **35,** 73

PAGE.

Nāl—*contd.*
Os Innominatum at —, . . . . . . . . . . . **35,** 70
physical affinities of race at —, . . . . . . . . . **35,** 73
pottery at —, . . . . . . . . . . . . **35,** 38, 57
skull found at —, . . . . . . . . . . . **35,** 65, 70
Sohr Damb at —, . . . . . . . . . . . **35,** ii, 17
stones found at —, . . . . . . . . . . **35,** 28—33, 61
teeth of Nāl skull, . . . . . . . . . . . **35,** 67—69
tibia found at —, . . . . . . . . . . . **35,** 80
Nayars of Malabar, . . . . . . . . . . . . **35,** 61, 62
Necropolis, at Sohr Damb, . . . . . . . . **35,** 21, 28, 31, 32, 35

Neolithic—
man, . . . . . . . . . . . . . . **35,** 4
site, . . . . . . . . . . . . . . **35,** 68
times, inhabitants in —, . . . . . . . . . . **35,** 74
Nias, . . . . . . . . . . . . . . . **35,** 62
Nicobarese, Southern, exhumation and reburial, . . . . . . **35,** 58
Noetling, Dr. Fritz . . . . . . . . . . . . **35,** i
Ochre—red and yellow, . . . . . . . . . . **35,** 29, 35, 44
ornament made of bone, . . . . . . . . . . . **35,** 57
Os Calcis, Nāl, . . . . . . . . . . . . . **35,** 73
Os Innominatum, Nāl, . . . . . . . . . . . **35,** 70
Pin, bone found at Ghaiur Kala . . . . . . . . . **35,** 58
Pir Chhattar, . . . . . . . . . . . . . **35,** 39
Plain wares . . . . . . . . . . . . . **35,** 13—16
Potsherds—decorated . . . . . . . . . . . . **35,** 12, 13

Pottery—
at Nāl, . . . . . . . . . . . . . . **35,** 38
at Sampur, . . . . . . . . . . . . . **35,** 4—6
at Sohr Damb, Nāl, . . . . . . . . . . . **35,** 17, 57
funerary —,. . . . . . . . . . . . . **35,** 20—26
ornamented —, . . . . . . . . . . . . **35,** 33—38
Prehistoric human remains at Nāl, . . . . . . . . . **35,** 56
Primitive races of India, . . . . . . . . . . . **35,** 76
Proto-Australoid stock, . . . . . . . . . . . **35,** 77, 78, 80
Proto-Negroid stock, . . . . . . . . . . . . **35,** 77, 78, 80

Quetta—
Curator of Museum in —, . . . . . . . . . . . **35,** ii
McMahon Museum—, . . . . . . . . . . . . **35,** ii
mounds near —, . . . . . . . . . . . . . **35,** 7
vessels from Mastung in museum, —, . . . . . . . . **35,** 4
Rafters, . . . . . . . . . . . . . . . **35,** 30, 31
'Rasi fanam' . . . . . . . . . . . . . . **35,** 61
Safaid Bulandi, . . . . . . . . . . . . . **35,** 3. 7
Sagittal suture of Nāl cranium, . . . . . . . . . . **35,** 64

PAGE.

Sampur Mound—
- antiquities from —, . . . . . . . . . . . . . **35,** 8—12
- coin from —, . . . . . . . . . . . . . **35,** 5
- comparison with Kalat Miri, . . . . . . . . . . . **35,** 3
- decorated potsherds from —, . . . . . . . . . . **35,** 12, 13
- excavations at —, . . . . . . . . . . . . **35,** 1—7
- figurines from —, . . . . . . . . . . . . **35,** 6
- kachcha bricks —, . . . . . . . . . . . . **35,** 2—6
- plain wares from —, . . . . . . . . . . . **35,** 13—16
- position of —, . . . . . . . . . . . . . **35,** 1
- pottery from —, . . . . . . . . . . . . **35,** 4—6
- silver cup from —, . . . . . . . . . . . . **35,** 4
- terracottas from —, . . . . . . . . . . . **35,** 6
- vessels from —, . . . . . . . . . . . . **35,** 3

Sayce, Professor . . . . . . . . . . . . . . **35, i**

Seals, . . . . . . . . . . . . . . . . **35,** 10, 32

Sewell, Seymour Lt.-Col.—reports on bones from Nāl, . . . . . . **35,** 21—30

Shell, . . . . . . . . . . . . . . . . **35,** 10, 33, 41

" Sialkot " cranium . . . . . . . . . . . . . **35,** 56—66, 80

Sibi—Lundi Mound near —, . . . . . . . . . . . **35,** 7

Silver—
- cup from Sampur Mound, . . . . . . . . . . . **35,** 4
- ring from Sohr Damb, . . . . . . . . . . . . **35,** 33
- foil oxidized, . . . . . . . . . . . . . **35,** 33

Skulls—
- at Aditanallur, . . . . . . . . . . . . . **35,** 76, 77
- age of individual to whom Nāl skull belonged . . . . . . **35,** 64
- Combe Capelle —, . . . . . . . . . . . . **35,** 79
- at Nāl, . . . . . . . . . . . . . . **35,** 61—70
- method of treatment —, . . . . . . . . . . . **35,** 61
- at Kish, . . . . . . . . . . . . . . **35,** 78

Smith, Sidney, compares Indus valley and Babylonian scripts . . . . . **35, i**

Sohr Damb—
- animals of —, . . . . . . . . . . . . . **35,** 39
- antiquities from —, . . . . . . . . . . . . **35,** 18, 33, 38
- beads from —, . . . . . . . . . . . . . **35,** 24—34
- bones from —, . . . . . . . . . . . . . **35,** 21—33
- burials at —, . . . . . . . . . . . . . **35,** 21, 22, 26
- chiragh from —, . . . . . . . . . . . . . **35,** 26
- copper chisel from —, . . . . . . . . . . . **35,** 23
- culture of —, . . . . . . . . . . . . . **35,** 37—39
- excavations at —, . . . . . . . . . . . . **35,** 7, 17, 18
- funerary pottery at —, . . . . . . . . . . . **35,** 20—24
- inhumation, forms of, at —, . . . . . . . . . . **35,** 28
- Marshall, Sir J. note on —, . . . . . . . . . . **35,** 35
- Necropolis at —, . . . . . . . . . . . . . **35,** 21
- new type pottery at —, . . . . . . . . . . . **35,** 17

PAGE.

Sohr Damb—*contd.*
peoples at —, . . . . 35, 37, 39
pottery at —, . . . . 35, 35—38
silver found at —, . . . . 35, 33
terracottas found at —, . . . . 35, 42, 43
vessels, ornamented at —, . . . . 35, 33
Soul—belief in escape of —, . . . . 35, 62
South India—earliest inhabitants of —, . . . . 35, 76
Stein, Sir Aurel—report of 1904 survey, . . . . 35, i
Stone—
weight, . . . . 35, 28
ringstone, . . . . 35, 28
chisel, . . . . 35, 28, 32
grinding, . . . . 35, 32, 33
pounding, . . . . 35, 31, 33
in skull, . . . . 35, 61
Sumer—
culture — resemblance to —, . . . . 35, 74
inhabitants of, not Dravidian —, . . . . 35, 76
inhabitants of, Indian in type —, . . . . 35, 76
kingdom of —, . . . . 35, 75
remains of, excavations —, . . . . 35, 74
Susa—cups from —, . . . . 35, 36
Sweeper caste burials, . . . . 35, 62
Taxila—
Indo-Parthian stratum at —, . . . . 35, 4
bronze cups from —, . . . . 35, 4
copper vessel from —, . . . . 35, 4
Teeth of Nāl skull, . . . . 35, 67—69
Terracottas—
see Appendix I, . . . . 35, 42, 43
see Appendix A, . . . . 35, 8—12
Tibia, Nāl, . . . . 35, 72
Platycnemia present in —, . . . . 35, 72
Todd, Mr. H. J. . . . . 35, ii
Udayas—burial customs of —, . . . . 35, 58
Veddah crania, . . . . 35, 66
Veddah of Ceylon, . . . . 35, 76
Vessels—
canister like —, . . . . 35, 35
funerary —,. . . . . 35, 20—35
McMahon Museum, in —, . . . . 35, 3
Nāl, — from, . . . . 35, 18, 33
Sampur Mound, — from, . . . . 35, 3
storage of —, . . . . 35, 4
twin —, . . . . 35, 35
undecorated —, . . . . 35, 35
Viravaya haro or *fanam*, . . . . 35, 61

MGIPC—M—III-9-4—18-4-29—500.

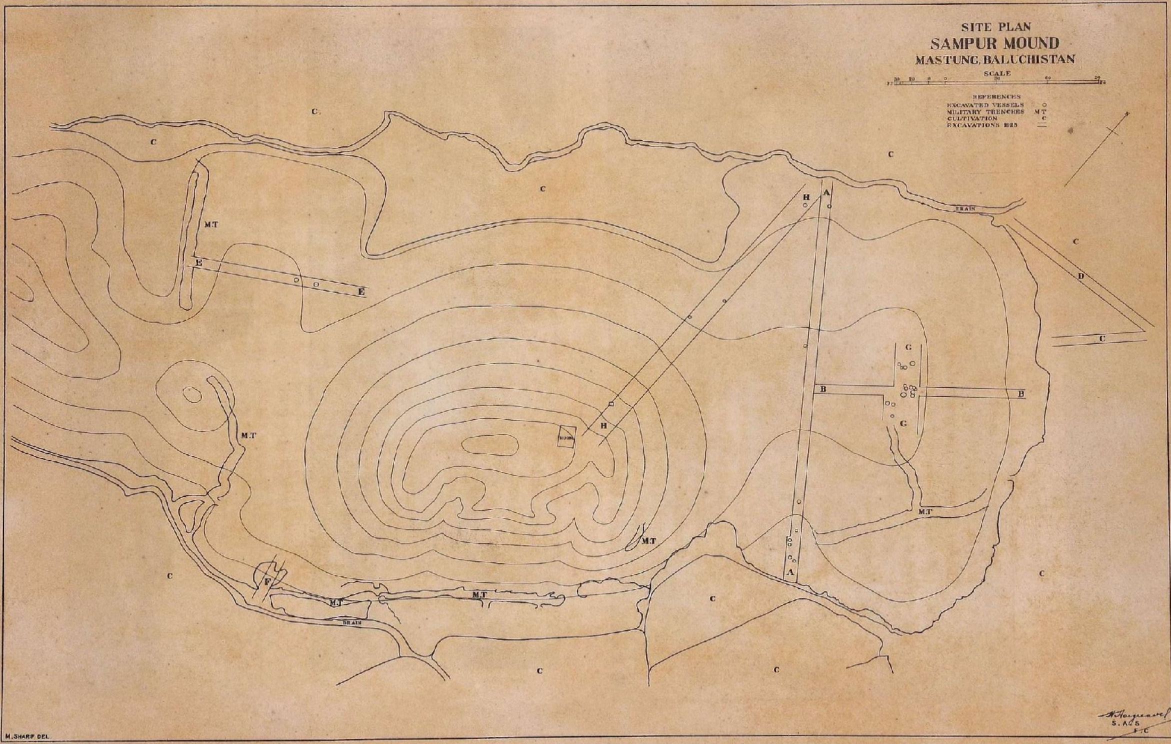


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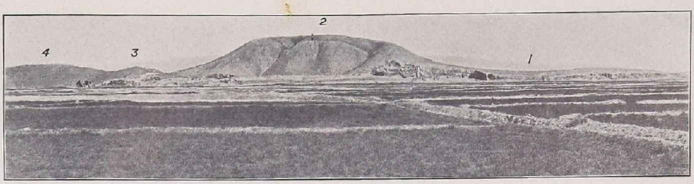
PLATE I.

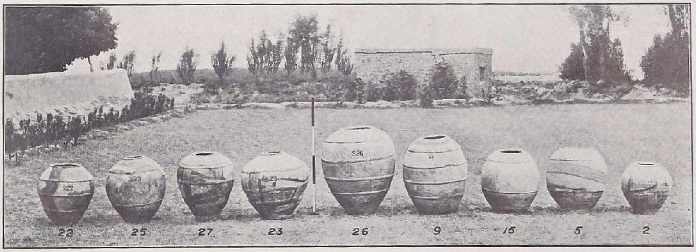
PLAN OF SAMPUR MOUND, MASTUNG.

# EXCAVATIONS AT MASTUNG.

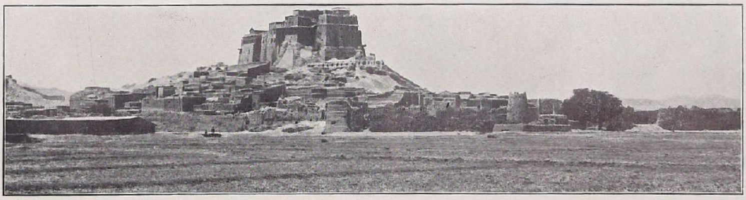



(*a*) SAMPUR MOUND FROM SOUTH.

(*b*) TRENCH G. VESSELS *IN SITU*.




(*c*) EXCAVATED VESSELS SENT TO THE QUETTA MUSEUM.



(*d*) THE MIRI, KALAT.

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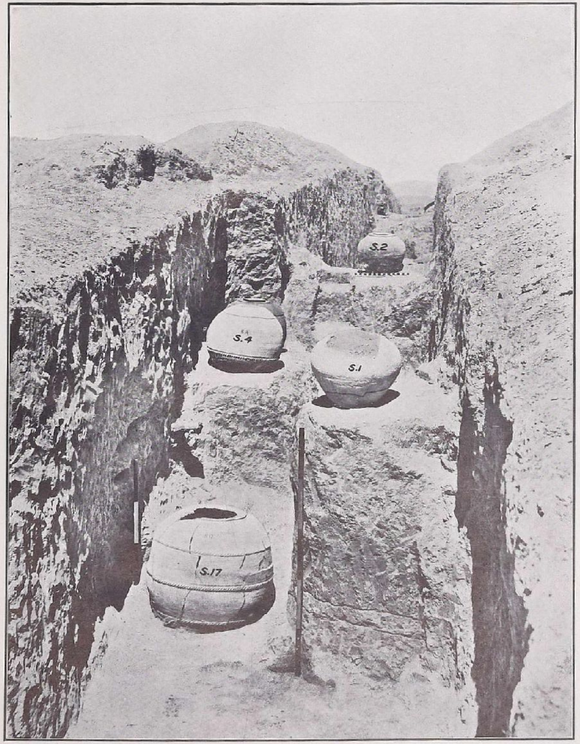
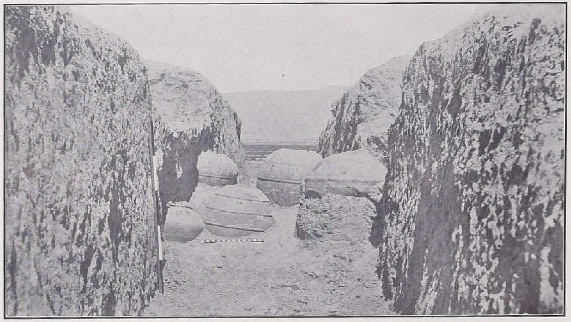



(*a*) TRENCH A. VESSELS *IN SITU*.



(*b*) TRENCH B. VESSELS *IN SITU*.

(*c*) SHALLOW DISH WITH INCISED ORNAMENT.

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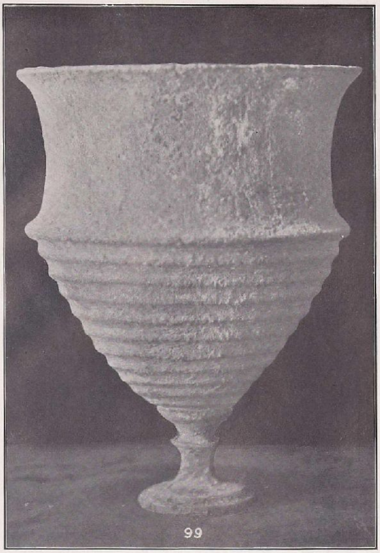
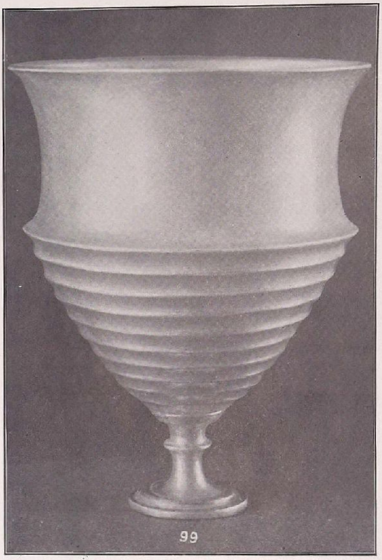
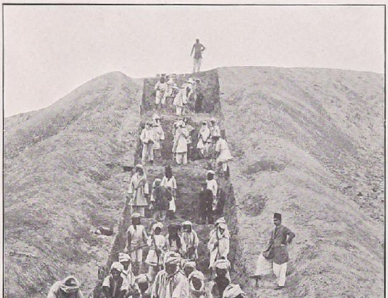
EXCAVATIONS AT MASTUNG.



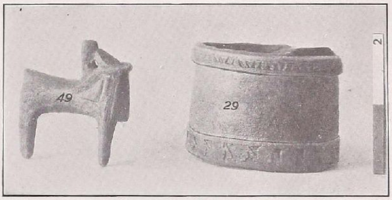

(a) SILVER CUP AS FOUND.



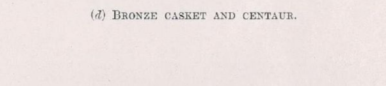

(b) SILVER CUP AFTER CLEANING.



(c) TRENCH H.



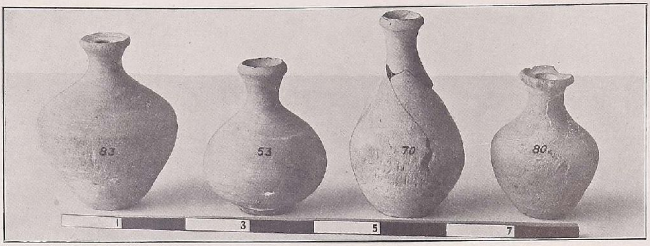

(d) BRONZE CASKET AND CENTAUR.



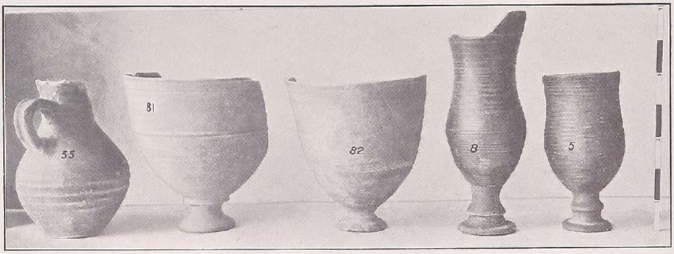

(e) MINIATURE VESSELS.

Photo.-engraved & printed at the Offices of the Survey of India Calcutta, 1928.

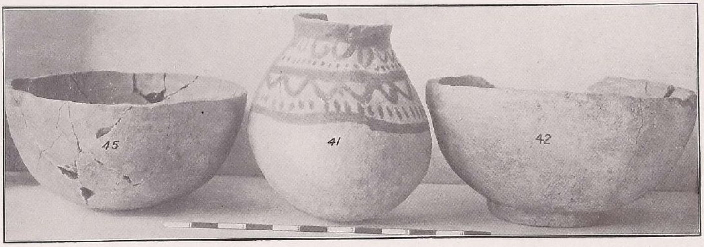
EXCAVATIONS AT MASTUNG.



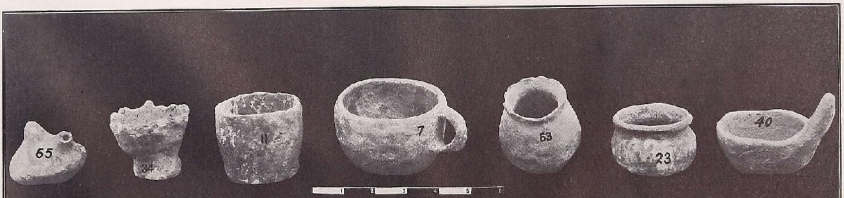

(*a*) MINIATURE VESSELS.




(*b*) JUG AND DRINKING VESSELS.




(*c*) HAND MADE VESSELS.




(*d*) HAND MADE UTENSILS.

Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1928.

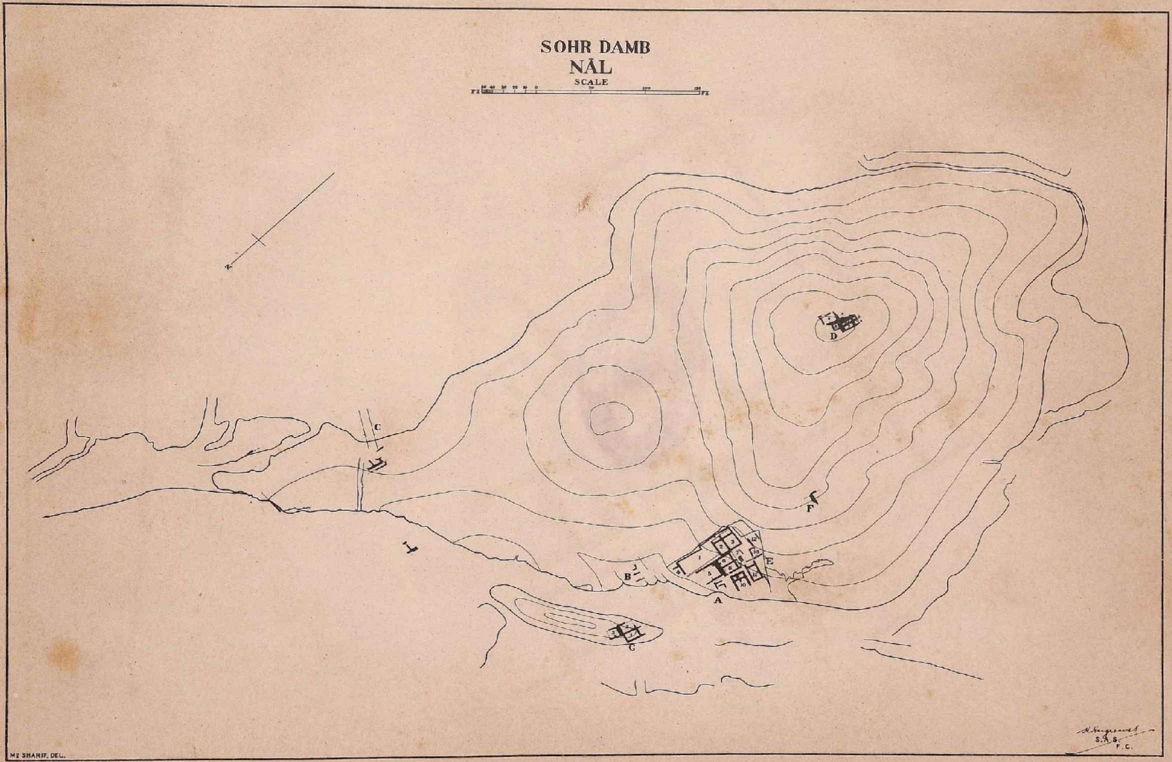



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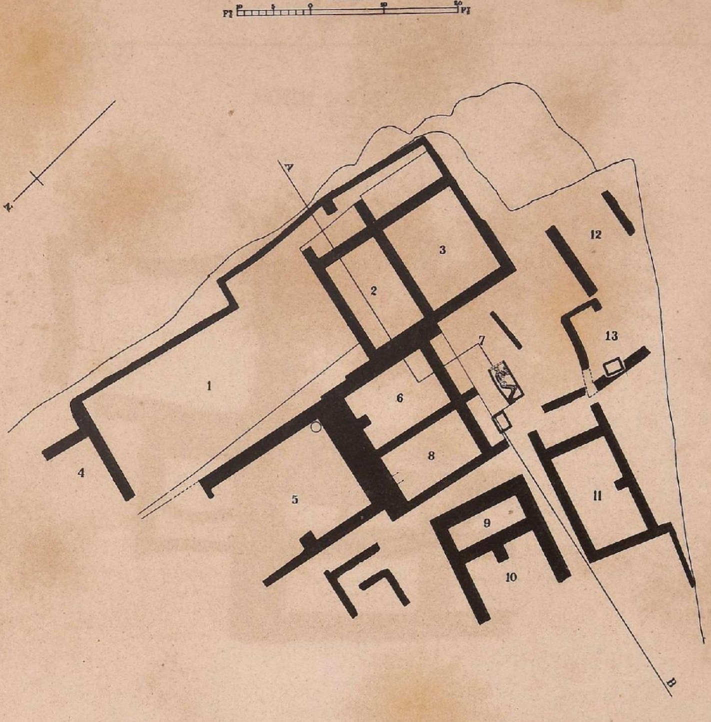
PLATE VI.

PLAN OF THE SOHR DAMB.

# SOHR DAMB, NĀL
## AREA A

SCALE




SECTION ON A.B.

MOHD SHARIF, DEL.

H. Hargreaves
S. A. S
F. C.

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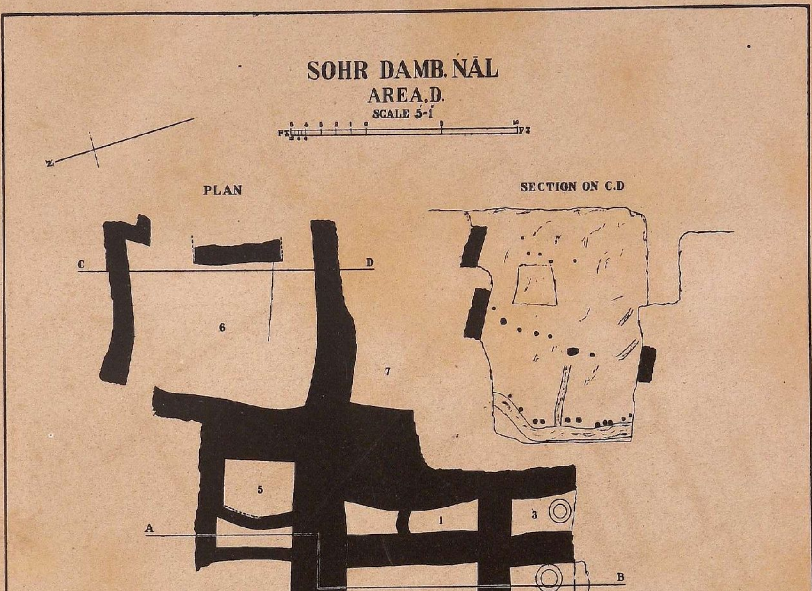
Plan and section of Area A.




Reg. No. 3521 E. 28

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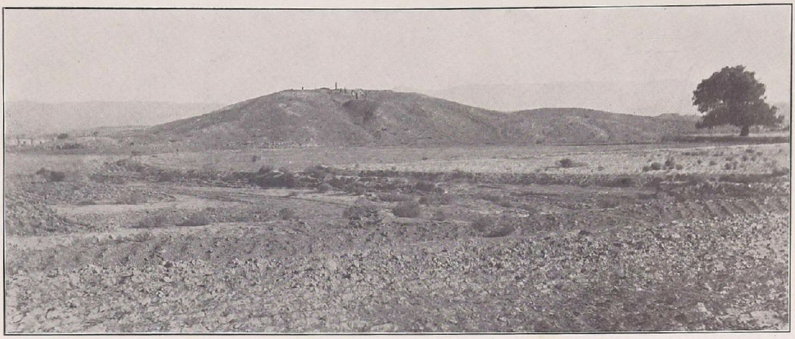
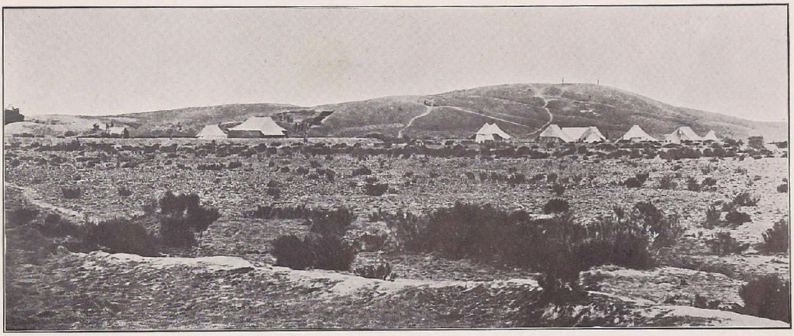
PLAN AND SECTION OF AREA D.

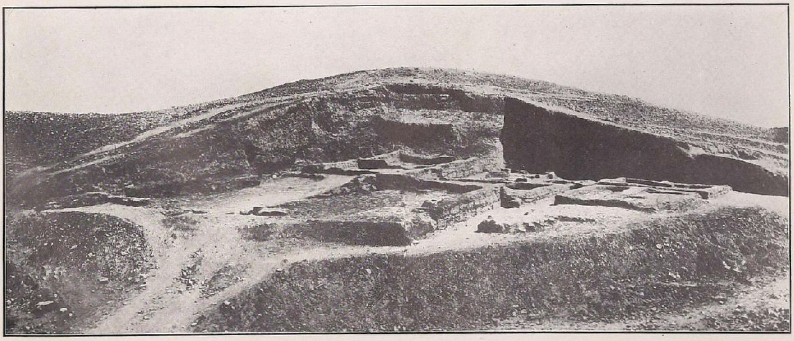
EXCAVATIONS AT NAL.



(*a*) SOHR DAMB FROM SOUTH.



(*b*) SOHR DAMB FROM WEST.



(*c*) AREA A AFTER EXCAVATION.

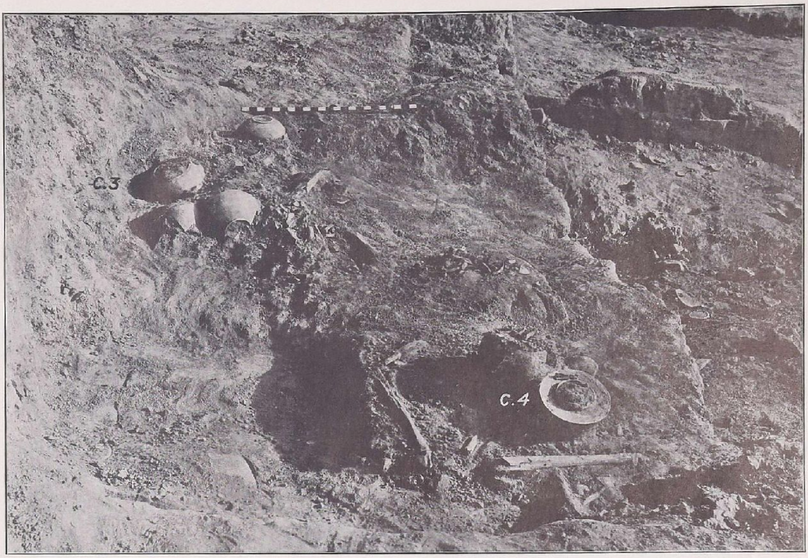
Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1928.

EXCAVATIONS AT NAL.

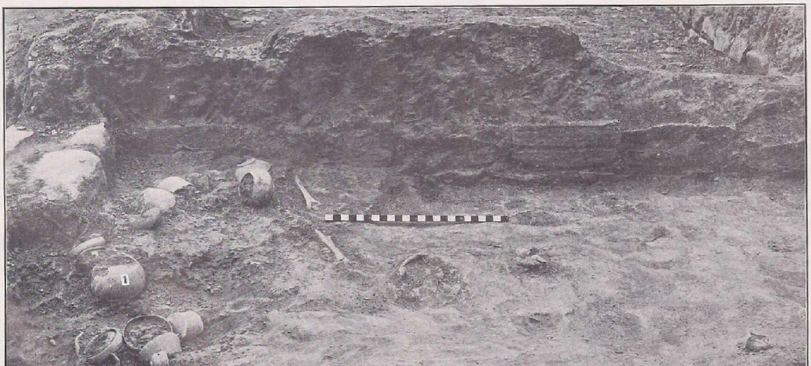
(*a*) Area A from south-west.

(*b*) Area A from south-east.

Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1928.



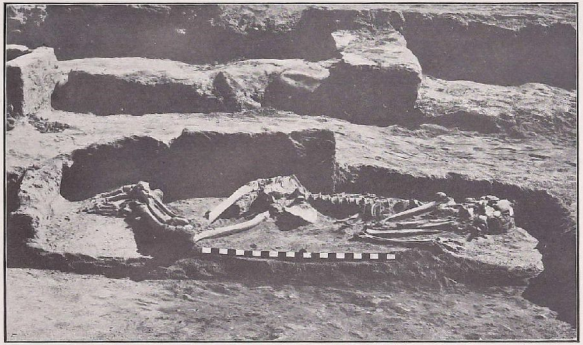

(a) BURIAL GROUPS C3 AND C4.



(b) BURIAL GROUP F.

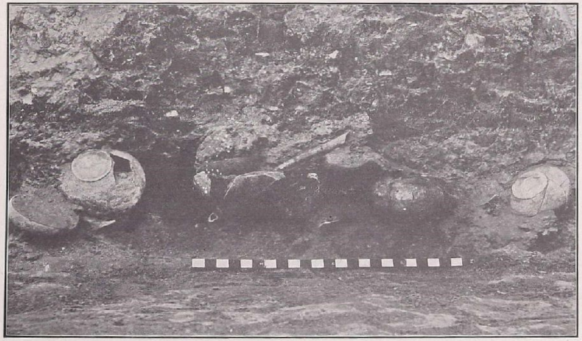
Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1928.

EXCAVATIONS AT NAL.

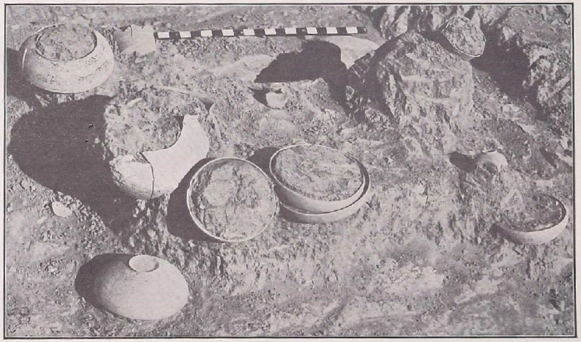


(*a*) COMPLETE BURIAL.

(*b*) BURIAL GROUP B.

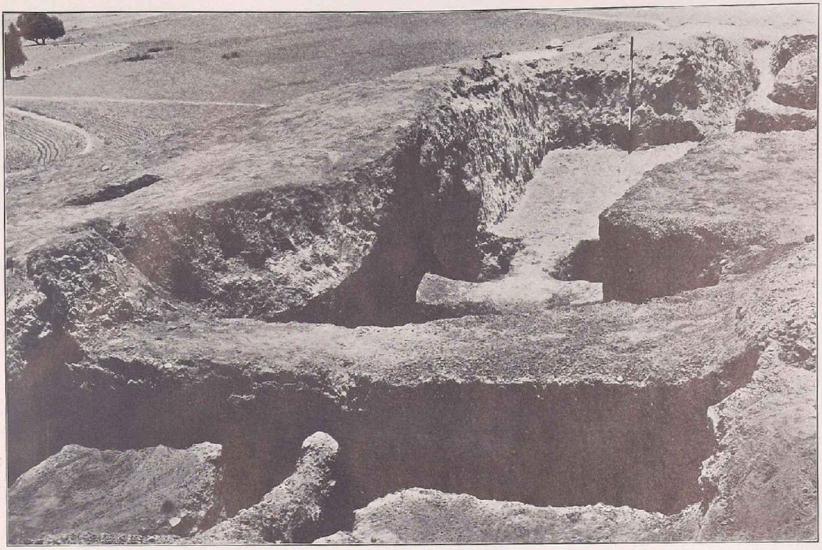


(*c*) BURIAL GROUP A.

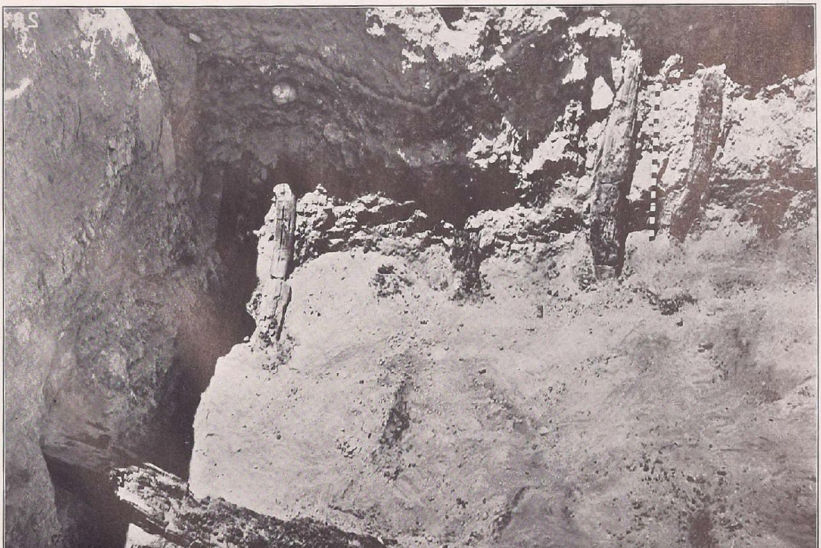


(*d*) BURIAL GROUP IN G 3.

Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1928.

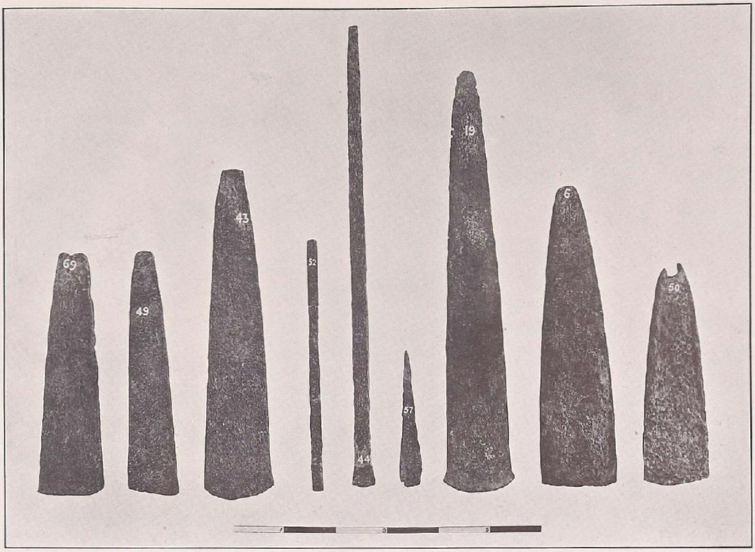


(*a*) AREA D LOOKING SOUTH.

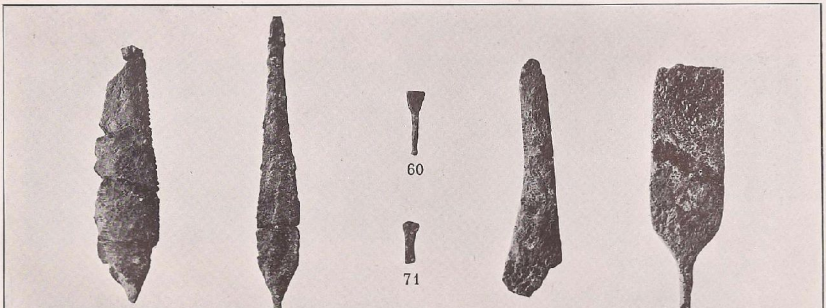


(*b*) INTERIOR OF ROOM D 6 FROM SOUTH.

Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1928.

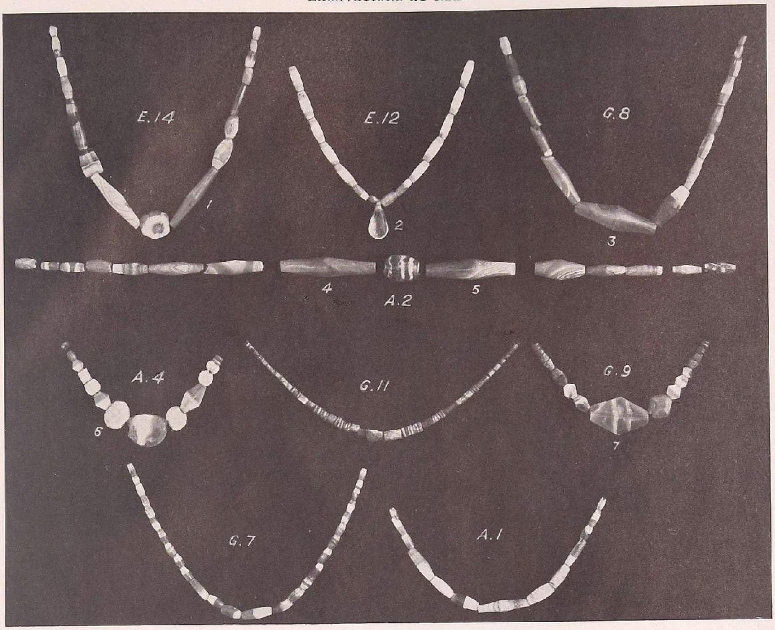



(a) COPPER IMPLEMENTS.

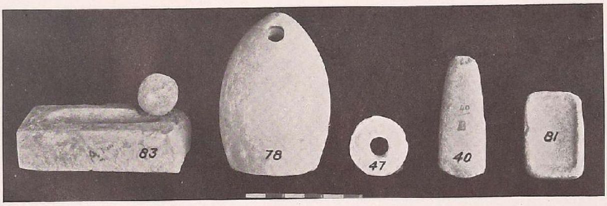



(b) COPPER IMPLEMENTS.

Photo-engraved & printed at the Offices of the Survey of India, Calcutta. 1928.



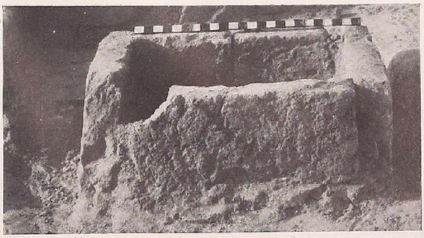

(*a*) BEADS.




(*b*) STONE ANTIQUITIES.

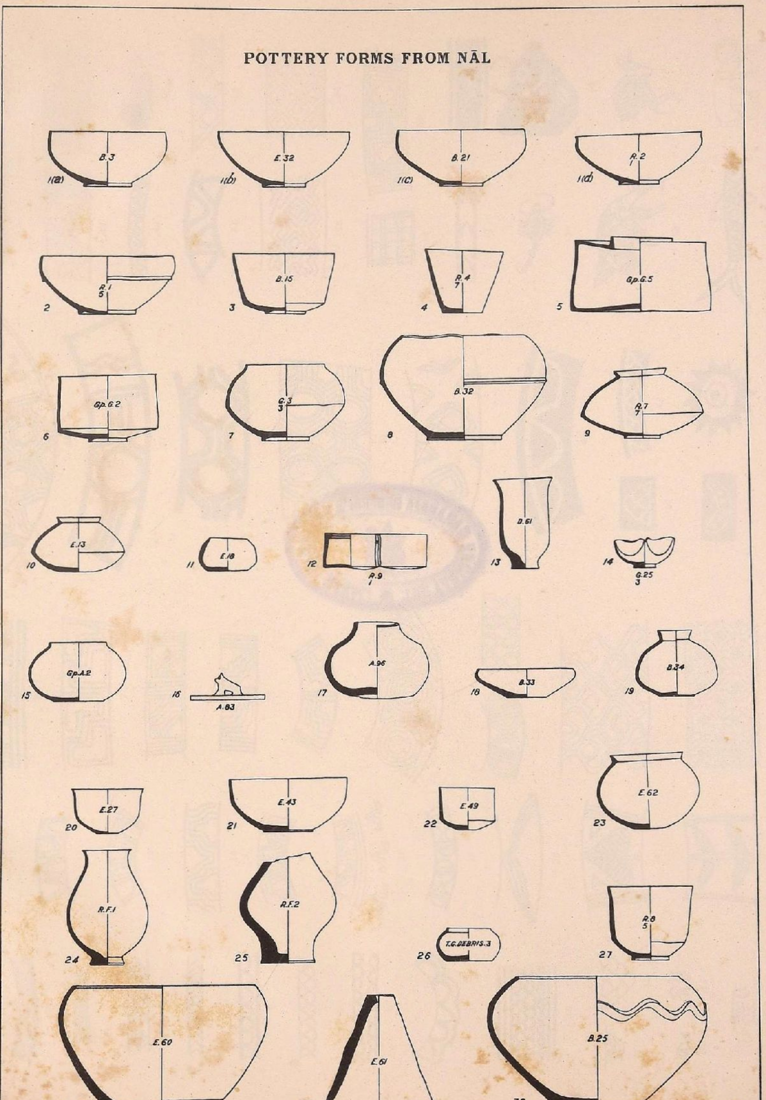
(*c*) TWO VESSELS CONCEALING FRAGMENT OF SKULL.

(*d*) COPPER SEAL.



(*e*) INFANT'S GRAVE IN A 7.

(*f*) SEAL AND SEALING.

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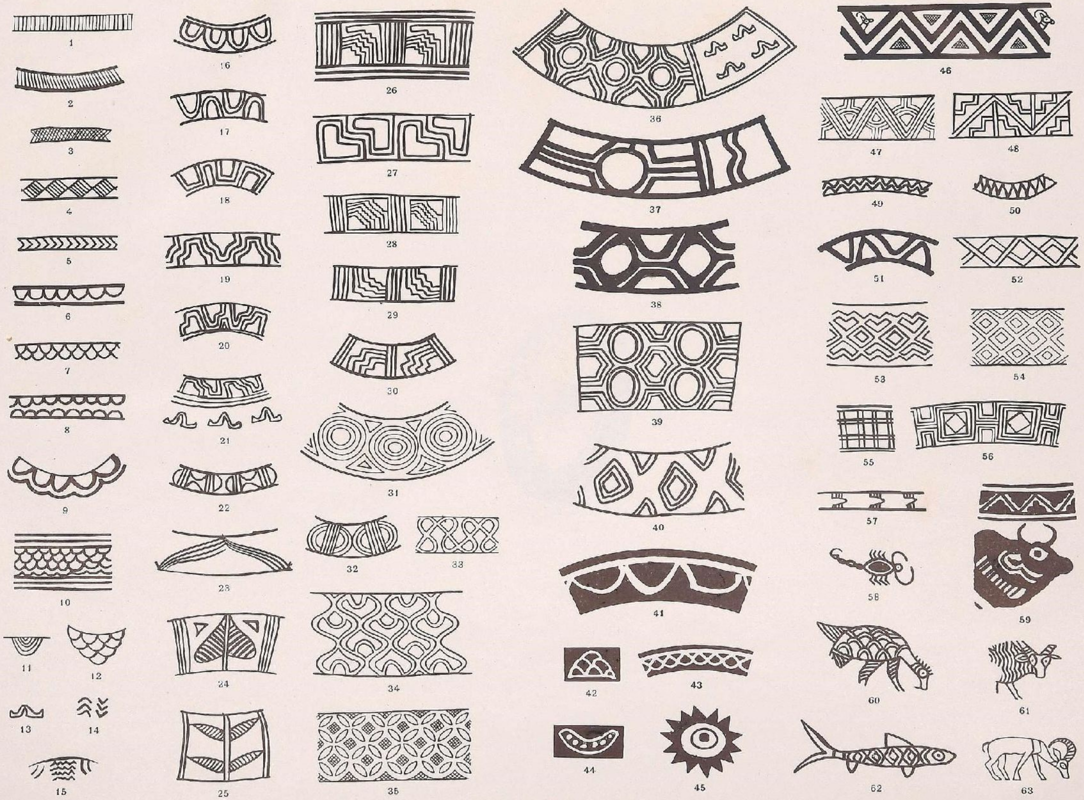
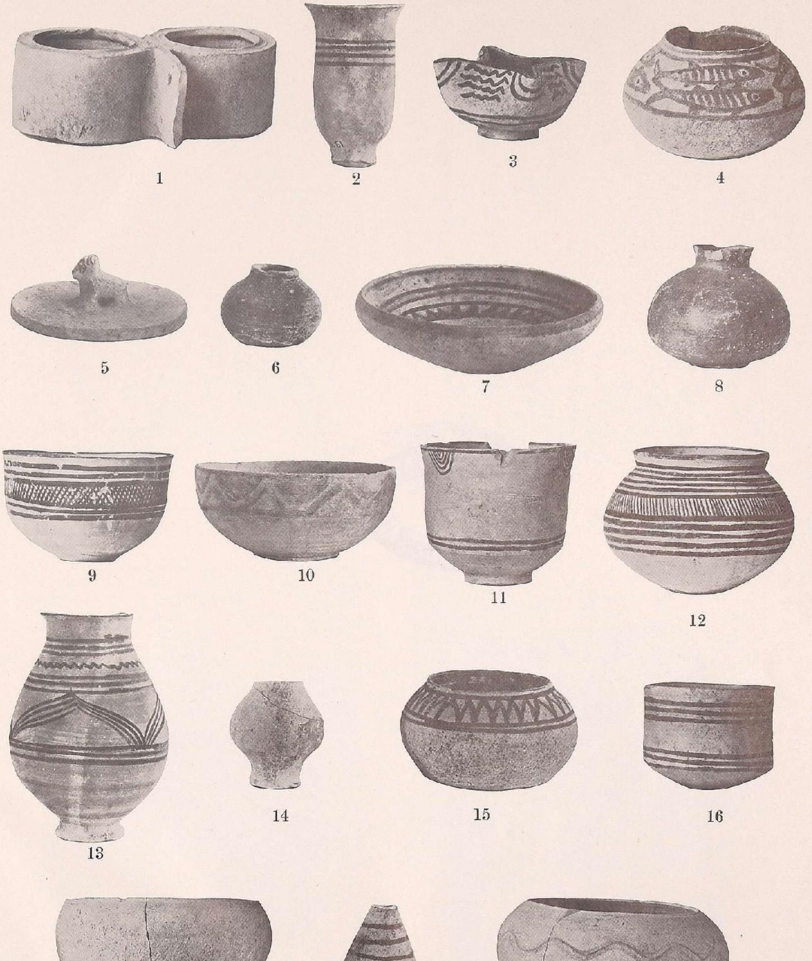
POTTERY FORMS FROM NAL.



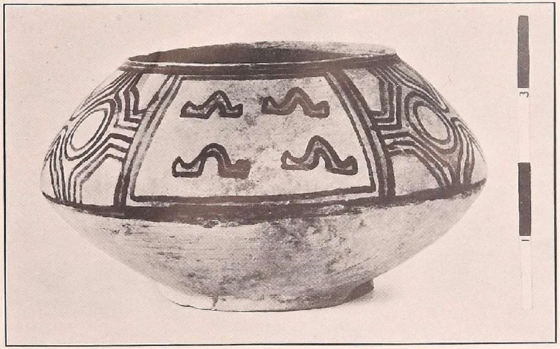

DESIGNS ON NAL POTTERY.

PLATE XVII.

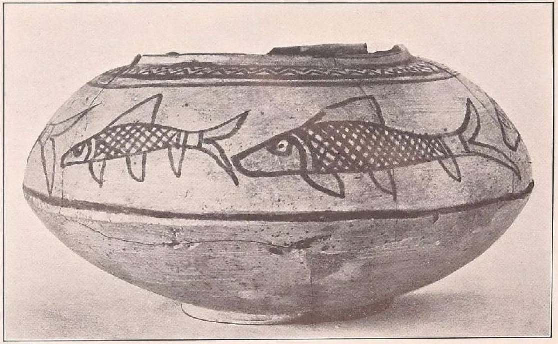
NAL POTTERY. TYPES 1-11.



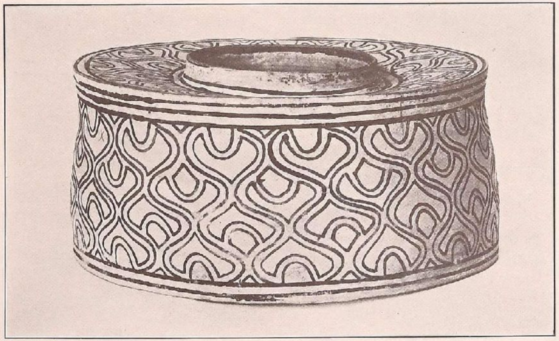

Nal Pottery, Types 12-30.



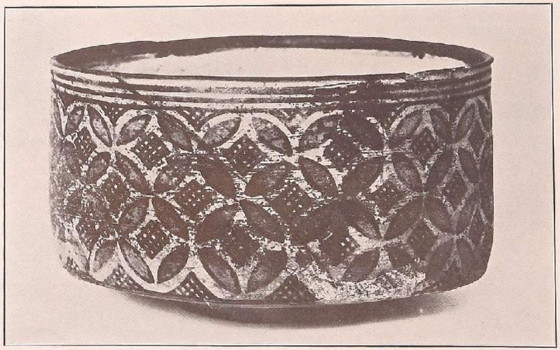
(a)



(b)



(c)



(d)

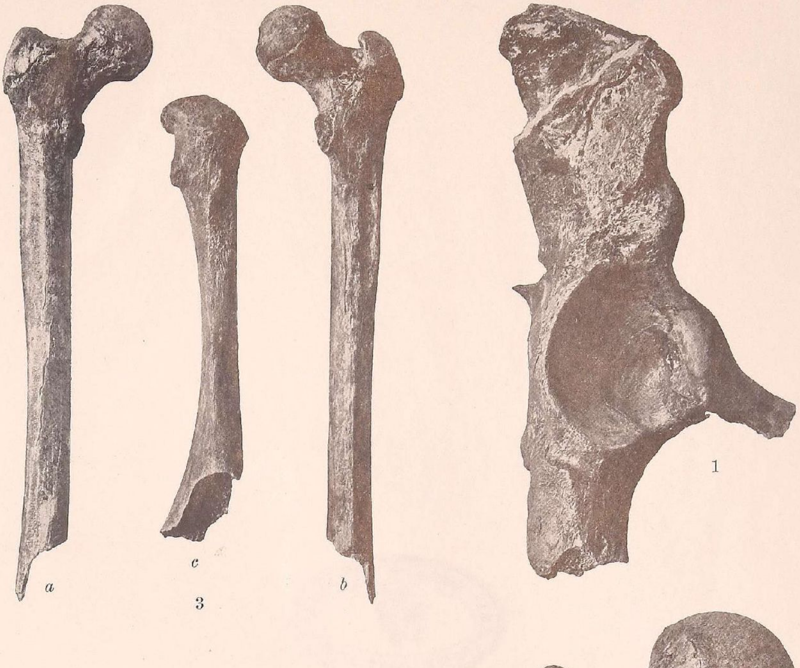
FOUR POLYCHROME VESSELS.

Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1928.

POTSHERDS, FIGURINES AND FUNERARY IMPLEMENTS.

1. Skull, viewed from right side (Norma lateralis).
2. Skull, viewed from behind (Norma occipitalis).
3. Skull, viewed from in front (Norma facialis).
4. Skull, viewed from above (Norma verticalis).
5. Skull, viewed from below; showing the stone *in situ* at the back of the Palate and Posterior Nares.

S. C. Mendul, Photo.



S. C. Mondul, Photo.

1. THE OS INNOMINATUM (ITEM 6, COLLECTION NO. 10, GROUP E).
2. THE HEAD AND UPPER END OF THE FEMUR (ITEM 22, COLLECTION NO. 14, GROUP B, FROM ROOM 6).
3. (*a*) ADULT FEMUR, FROM IN FRONT; (*b*) ADULT FEMUR, FROM BEHIND; (*c*) INFANT FEMUR (THE EPIPHYSES ARE WANTING) FROM BEHIND.
4. CALCANEUM. (*a*) FROM ABOVE; (*b*) FROM BELOW.

PLATE XXIV.

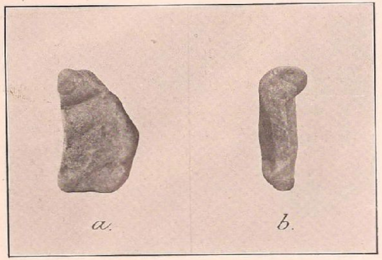



FIG. 1—THE STONE, VIEWED FROM (*a*) ABOVE, (*b*) THE SIDE. (NATURAL SIZE).

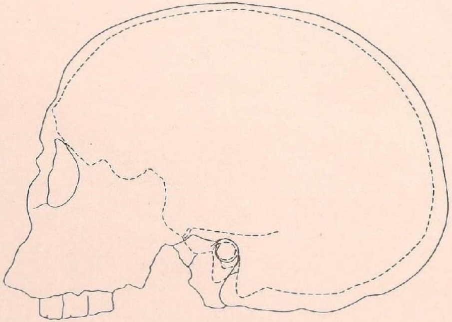


FIG. 2—OUTLINES, OF THE "NAL" SKULL (BLACK) AND THE "SIALKOT" SKULL (DOTTED).

FIG. 3—OPTICAL TRANSVERSE SECTIONS OF VARIOUS LONG BONES.

(*a*) ADULT FEMUR, UPPER PART OF SHAFT, RIGHT SIDE.
(*b*) ,, ,, AT MIDDLE OF PILASTER, ,, ,,
(*c*) ADULT TIBIA, ABOUT MIDDLE OF SHAFT, LEFT ,,
(*d*) INFANT FEMUR, UPPER PART OF SHAFT, ,, ,,
(*e*) ,, ,, AT MIDDLE OF PILASTER, ,, ,,
(*f*) INFANT TIBIA, ABOUT MIDDLE OF SHAFT, RIGHT SIDE.

Photo.-engraved & printed at the Offices of the Survey of India, Calcutta, 1929.